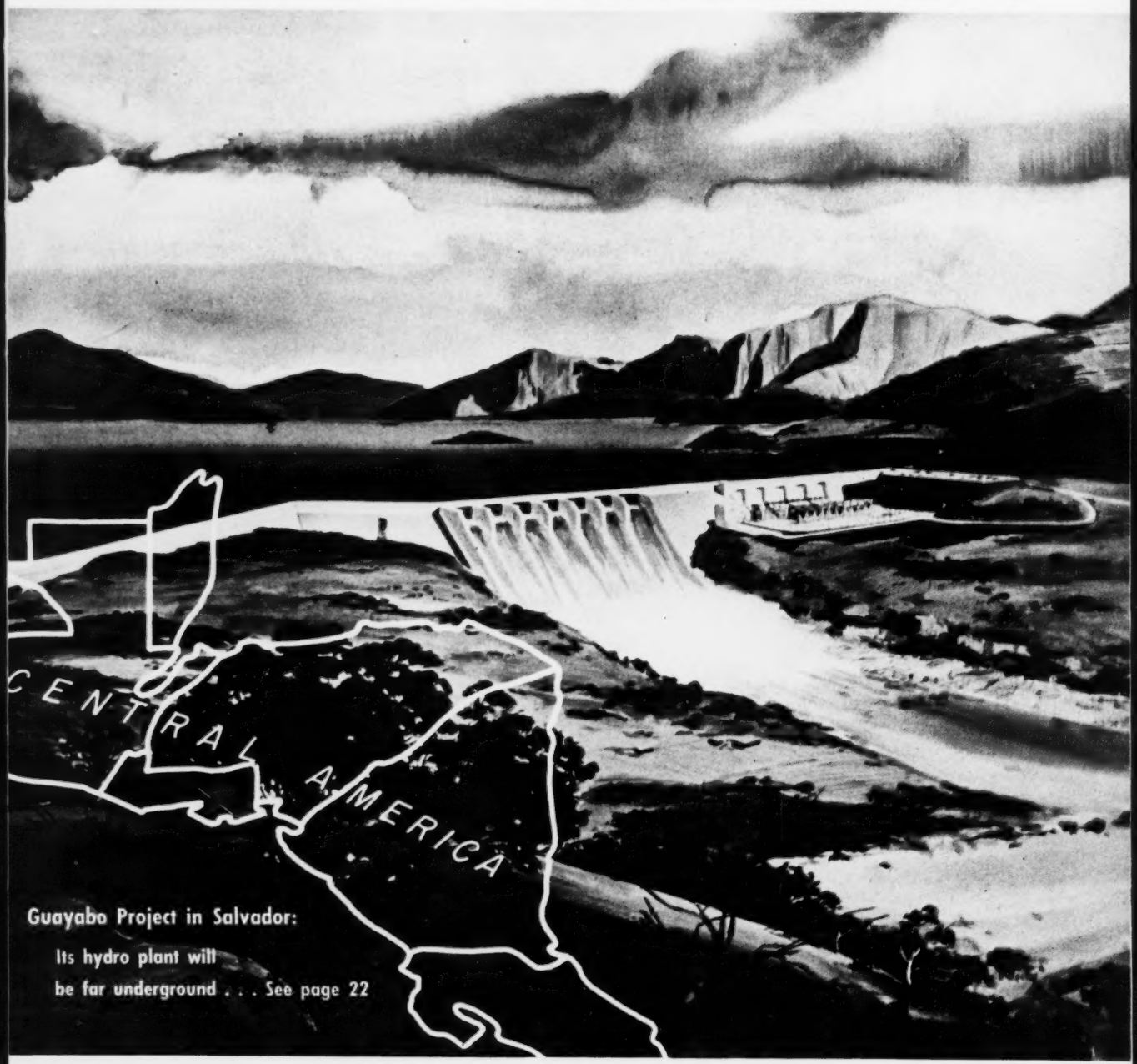
APRIL 27, 1953

NEWS ISSUE

Electrical World

Price 35 Cents

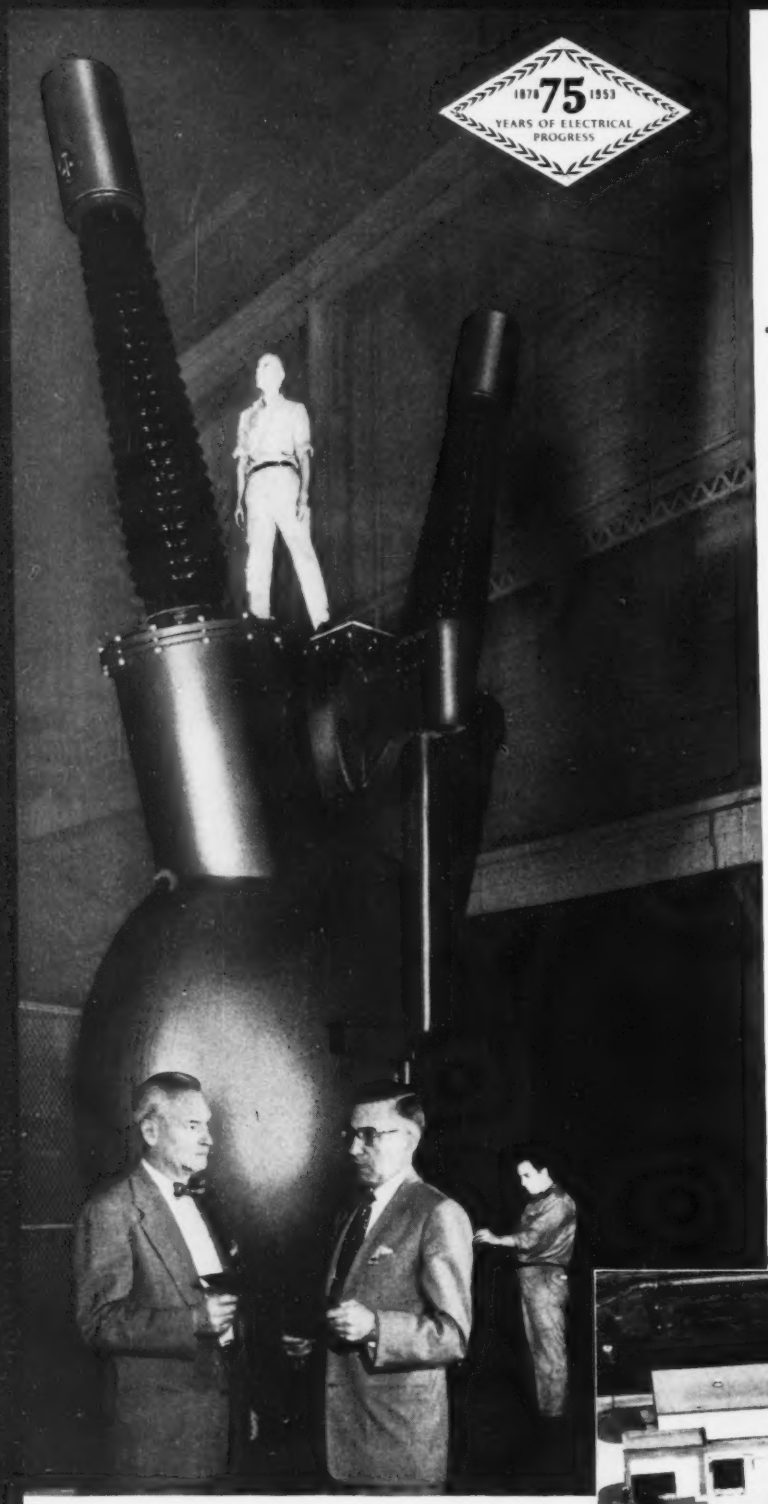
A McGRAW-HILL PUBLICATION



Guayabo Project in Salvador:
Its hydro plant will be far underground . . . See page 22

Spreading the Word on the Heat Pump . . . Page 16

Big Worry: Not 'Peace', but Inventory . . . Page 50



25 MILLION KVA IMPULSE BREAKER

Newest switchgear advance opens way for increased circuit loadings—greater system economies through use of higher voltage transmission

Transmission voltages of 330-kv or more, with circuit loadings approaching a million kilowatts over a 3-phase line, are now seen as the logical pattern for the future on many heavily loaded and constantly expanding systems.

Making possible the economic and other benefits to be gained from such developments are advances like the new G-E steel-clad impulse breaker, one pole of which is shown here. First of several 3-pole units for a 330-kv transmission system under construction, this breaker is rated at 1600 amperes continuous current, 25,000,000-kva interrupting capacity. Features include 3-cycle interrupting time, and 20-cycle reclosing time.

Incorporating the time-tested impulse principle of interruption, the new steel clad breaker design is the result of twenty years of intensive research and development. Behind it is the experience gained in building circuit breakers of continually increasing current carrying and interrupting capacity that have paced every previous step forward in high voltage transmission.

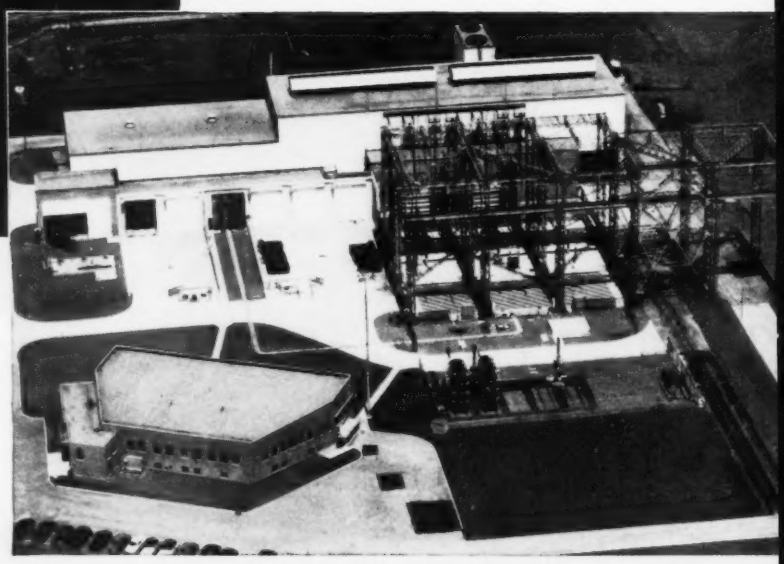
Research leading to further advances in higher voltage equipment will continue, with increasing opportunities for efficient, economical application. General Electric Co., Schenectady 5, N. Y.

301-223

MORE POWER TO AMERICA

GENERAL ELECTRIC

Highest rated circuit breaker ever built, the complete unit comprises three poles, only one of which is shown assembled for testing in the photo above. In the foreground are George Burens (left), General Manager of Switchgear and Control Division, with Earl B. Rietz, Engineer, Power Circuit Breaker Section. Mr. Rietz was responsible for engineering and development work leading to the production of the breaker.

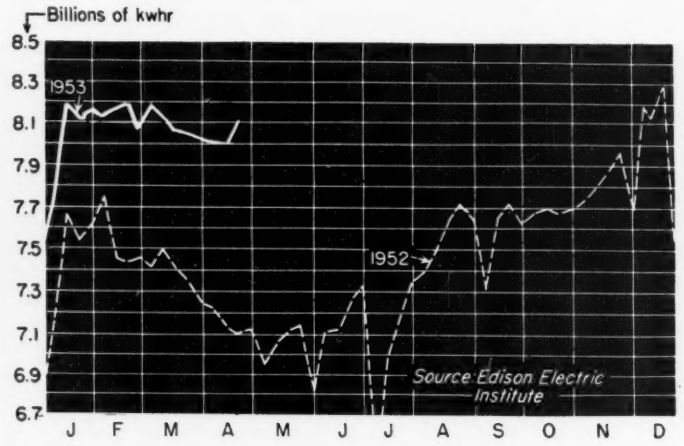


New G-E Switchgear Development Laboratory at Philadelphia (right), providing the world's highest capacity testing facilities, was an important factor in proving design features and making possible the many necessary tests.

VOLUME 139, NO. 17

April 27, 1953

Electrical World



Output Week Ended April 18—8,112,969,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
April 18	+14.2	+16.1	+11.4	+13.2	+11.9	+16.1	+10.3	+17.1	+15.0	+21.3
April 11	+11.8	+13.1	+6.8	+11.4	+8.9	+12.3	+10.0	+16.7	+15.3	+22.0
April 4	+11.1	+10.4	+7.0	+10.9	+9.2	+13.4	+6.4	+14.6	+11.0	+20.3

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	Jan.	74.9*	75.5	69.4
Capacity (Million Kw)	Feb.	82.83	82.38	75.99
Production (Billion Kwhr)	Feb.	33.60	36.66	31.54
Hydro		8.99	9.26	9.46
Fuel		24.60	27.40	22.07
Fuel Consumption				
Coal (Million Tons)	Feb.	9.16	10.49	8.74
Oil (Million Barrels)		6.81	7.70	4.77
Gas (Billion Cu Ft)		57.82	60.06	54.82
Sales (Billion Kwhr)	Jan.	32.07	31.20	29.72
Residential		9.82	8.91	8.87
Commercial		5.37	5.21	4.99
Industrial		14.90	15.11	13.90
Other		1.97	1.98	1.95
Net Income Class A & B Companies ($ Million)	Dec.	99.24	79.81	88.74
Estimated Dec. '53 Peak (Million Kw)	Jan.	87.0	87.0	88.9
Kwhr per Residential Customer (12 Month Average)	Dec.	2,169	2,155	2,004
Revenue per Kwhr Residential Service (12 Month Average)	Dec.	2.77¢	2.77¢	2.81¢
Canadian Production (Billion Kwhr)	Jan.	5.66	5.54	5.27

Business Statistics

FRB Industrial Production Index†††	Feb.	235*	232	218
Gross National Product Annual Rate ($ Billion)	4th Qtr.	355.2*	343.0	337.1
E. W. 5 Industry Production Index	Jan.	130.0*	129.8**	124.4
ENR Construction Cost Index††	Mar.	123.2	123.1	115.4
BLS Consumer Price Index	Jan.	190.4	190.7	189.1
NEMA Insulation Materials Sales Index†	Feb.	649	643	528
NEMA Electric Appliance Sales Index†		306	293	224
NEMA Household Refrig. Sales Index†		208	183**	153

* Preliminary ** Revised † 1936=100 †† 1949=100 ††† Unadjusted

THIS WEEK

The Electrical Week 5
In the Industry 10
Technical Notes 10
News About People 33
Sales and Service 39
Industrial Relations 41
Financial 44
Manufacturers and Markets 46
Electrical Business Outlook 50

RALPH H FLYNN, Publisher
FISCHER BLACK, Editor
DANIEL T BRAYMER, Managing Editor

A E KNOWLTON.....Senior Associate Editor
FRANK R INNES.....Associate Editor
LEONARD M OLMSTED.....Associate Editor
ROBERT C BLATT.....Associate Editor
KENNETH K KOST.....Associate Editor
HERBERT FRANKEL.....Associate Editor
EDWARD ALLEN.....Midwestern Editor
HOWARD KNOWLTON.New England Editor
RUE M SHOOP.....Middle Eastern Editor
FRANCIS KOVALCIK.....Western Editor
JOSEPH MICHALAK.....Assistant Editor
DAVID REA.....Assistant Editor
JOHN F WICKLEIN.....News Editor
JEANNE BERNHARDT..Assistant News Editor
IRIS ST CLAIR.....Departmental Editor
ARY MOSSIMAN.....Statistician
DALLAS MALLARD.....Art Director
ANN L ADAMS.....Production Editor
G B BRYANT, JR....Mgr. Washington Bureau
JESSE MOCK.....Washington Correspondent
DEXTER M KEEZER...Dir. Economics Dept.
ROBERT P ULIN.....Economics Department

WORLD NEWS BUREAU, Joseph K Van Denburg, Jr., Editor; London, Paris, Frankfurt, Tokyo, Bombay, Melbourne, Rio de Janeiro, Buenos Aires. DOMESTIC NEWS SERVICE, Atlanta, Chicago, Cleveland, Detroit, San Francisco, Houston. Correspondents in 43 cities.

ADVERTISING STAFF, District Managers E F Coffey, New York; N V Palmer, Boston; F P Coyle, Philadelphia; M S Kearney, Cleveland; F S Chapin, Detroit; W H Meneilley, Chicago; J T Schaefer, St. Louis.

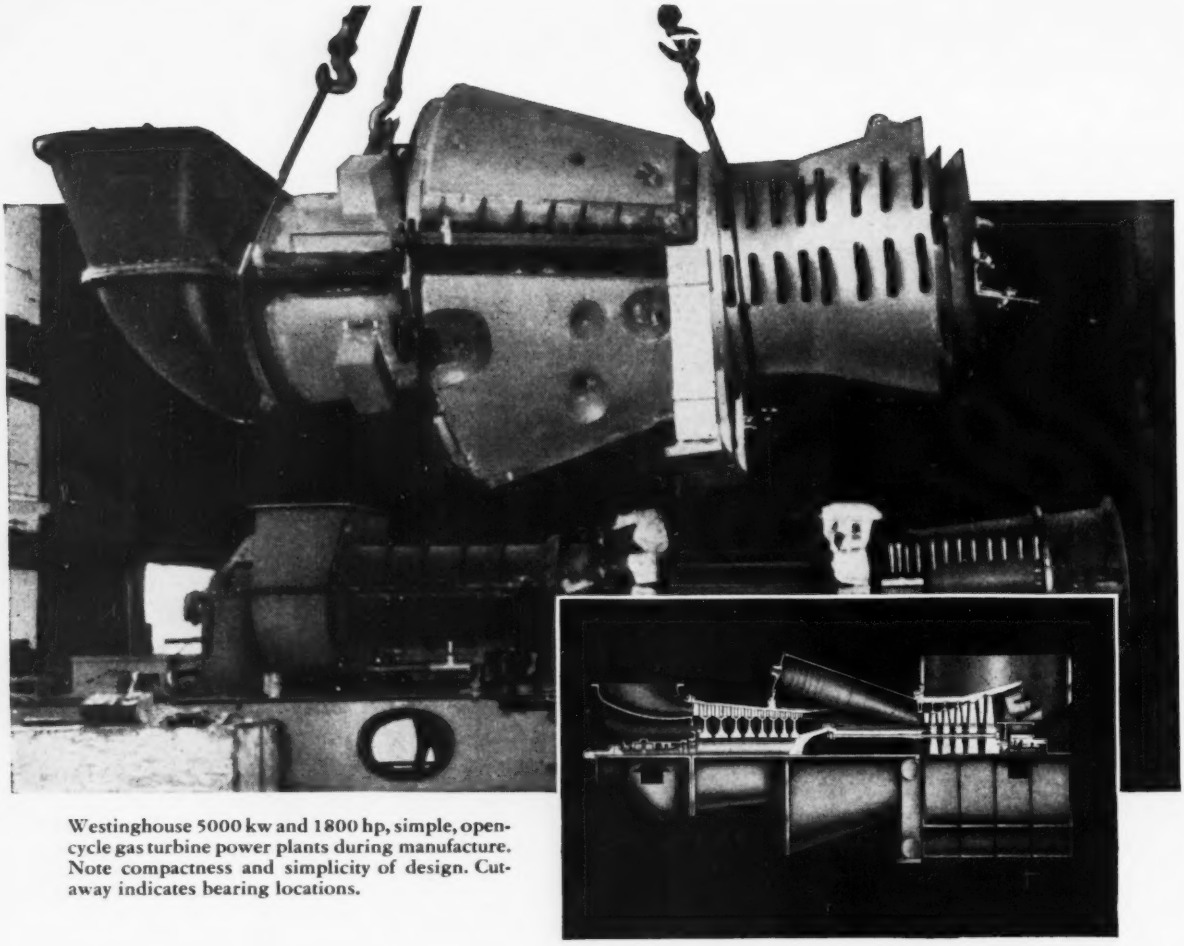
Electrical World • Vol. 139, No. 17, April 27, 1953

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 N. Broadway, Albany 1, N. Y. Executive, Editorial and Advertising Office: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President. Publication Division: Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Electrical World—Subscription Service, 99-129 North Broadway, Albany 1, N. Y. or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are accepted only from executive, supervisory, and engineering personnel in electric utilities, manufacturing companies, and related fields. Position and company connection must be indicated on subscription orders.

Single copies 35¢. For the United States and possessions $6 a year, $9 for two years, $12 for three years. Canada, $7 for one year, $11 for two years, $14 for three years. (Canadian money, at par.) Other Western Hemisphere, $15 for one year, $25 for two years, $30 for three years. All other countries, $25 for one year, $40 for two years, $50 for three years. Entered as second-class matter, November 16, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in USA. Copyright 1953, by McGraw-Hill Publishing Company, Inc. Permission required to reproduce any of contents.



Westinghouse 5000 kw and 1800 hp, simple, open-cycle gas turbine power plants during manufacture. Note compactness and simplicity of design. Cut-away indicates bearing locations.

Westinghouse 2-bearing gas turbine design means faster starting . . . less maintenance

The compact, two-bearing design of the Westinghouse 5000 kw Combustion Gas Turbine eliminates all hot, high pressure bearing seals. The two bearings are part of the main frame which means greater rigidity . . . less vibration —no misalignment difficulties—faster starting characteristics.

Combustors are arranged at an angle radially around the axial flow air compressor discharge and turbine inlet. Minimum bearing length and maximum combustor accessibility are realized, resulting in simplified and reduced maintenance.

The Westinghouse 5000 kw, simple, open-cycle combustion gas turbine power plant for electric power operation is ideally suited for (1) base load operation where fuel is inexpensive (2) where exhaust gas can be used for feed-water heating, steam generation or process work (3) peak load, stand-by and end-of-line electric plants (4) where water is scarce or expensive and (5) where mobile or semiportable plants are needed.

Call your local Westinghouse representative to help you utilize this modern efficient power source in your particular application. Or if you prefer, write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-50546

YOU CAN BE SURE...IF IT'S Westinghouse

THE ELECTRICAL WEEK

The Issue's News Highlights—Eisenhower Administration proposes substantial cuts in Interior Department and Army Corps of Engineers budgets . . . McKay disagrees with Hoover that federal government should get out of power business as soon as possible.

Southeast utilities should adopt standard, extra-high voltages for transmission of bulk power, SEE Engineering and Operation Section is told.

Interruptible loads in the Northwest are being curtailed as a result of light spring runoff and cold weather.

Quotes from EEI-AGA national conference of electric and gas utility accountants at Chicago—"So long as the rate of return is adequate to attract capital, the financial integrity of the utilities of this country will be safe," Spencer Eddy, New York PSC. "The time is fast approaching when short-term financing through banks may take precedence over the issuance of permanent financing," Harold Quinton, Southern California Edison.

Virginia E&P signs 20-year contract to supply all the power for Pamlico P&L in Hyde County, N. C. . . . Roanoke Rapids project of Virginia E&P will pose for motion pictures (sound and color) monthly during construction.

TVA Chairman Gordon Clapp, injured in plane crash on Feb. 24, was released from the hospital on April 11.

A. C. Monteith, engineering vice president, Westinghouse Electric Corp, is being sponsored for the presidency of the American Institute of Electrical Engineers by the Pittsburgh Section of the institute.

Mississippi P&L will lease on April 30, electric plant and distribution system of Gloster for 25 years . . . Linn County Farmers Union, Salem, Ore., is sponsoring formation of a six-county peoples' utility district . . . Fort Gibson hydro project of the Army Engineers in Oklahoma has spun the first of its four 12,500-kw generators.

Rochester G&E files new rates with the New York PSC which will equalize those in its rural area with those in Rochester and Monroe County. Some 29,000 rural customers will save about $223,000 a year. New rates will take effect late in May . . . Cazenovia Electric gets N. Y. PSC approval to revise rates for seasonal customers. Company estimates new rates will result in a reduction of $356 a year.

Burlington, Vt., is being sued by Pierce Consulting Engineering Co, Boston, for $100,000 in connection with steam contract dispute over delay in construction of the municipal power plant. When job is finished, plans have been made for Green Mountain Power to sell its distribution system in Burlington and lease the new station for 7.5 years.

Off the Washington Wire—It may be early August before the size of the federal power program for fiscal 1954 is known. Revision of budgets has taken time, and the Senate fight over the tidelands oil legislation has delayed consideration of the money bills.

House and Senate committees will give out-of-town witnesses a break by holding concurrent hearings on the request of the Corps of Engineers for multipurpose project funds.

To permit Federal Power Commission to speed up review of gas and electric rate increase applications, the House Appropriations Committee has approved a hike in FPC funds.

FPC has suspended a rate increase which Cincinnati G&E proposed to levy on subsidiary Union LH&P, Covington, Ky. . . . Wisconsin-Michigan Power has asked FPC permission to acquire a 7,200-kw hydro plant on the Menominee River from the Kingsford Chemical Co.

Five Washington PUD's, claiming that the Kitsap County Court has no jurisdiction because none is located in that county, have petitioned the State Supreme Court to prohibit the Kitsap judge from proceeding with a case to bar the PUD's from buying Puget Sound P&L. The judge had denied a motion to dismiss the action.

Oregon's Governor Patterson signs House Bill 104 which provides that when any public utility rate is increased it shall not become effective for 30 days unless the Public Utilities Commissioner shall hold a public hearing within that time.

Texas P&L has spurred appliance sales in its area by having a barbecue with pep talks by appliance manufacturers in Dallas for some 2,000 dealers and their wives. Sales Chief E. H. Gardiner, Jr, said the goal is "to try to get the dealers to move at a faster pace. Too many of them have been living off the fat of the land, and now they'll have to go to work."

TVA may not move its headquarters from Knoxville, Tenn., to Muscle Shoals, Ala. The House Appropriations Committee will reconsider the move.

Obituary—Daniel MacDougald, 70, chairman of Georgia Power, died of a heart attack, April 13, at Atlanta.

Congratulations—Central Illinois E&G promotes J. E. Murray from vice president and treasurer to president, succeeding D. C. McClure who becomes chairman. H. E. Braunig, vice president-operations, becomes executive vice president . . . Boston Edison for the third time gets certificate of management excellence from American Institute of Management.

Pennsylvania P&L gets Howard G. Ford Award sponsored by Sales Managers Association of Philadelphia for its outstanding 1952 sales plan, "Electricity for Freedom," and for its contributions to public enlightment of free enterprise system.

(*Continued on page* 10)

GOP Applies Knife to Its Power Budget

Proposed Revision of Interior Budget

Agency	Truman Budget	Eisenhower Budget	House Committee Recommends
	(Millions of Dollars)		
Interior Department	$607.2	$484.4	$403
Reclamation Bureau	231.1	177.4	141
Bonneville Power Adm.	62.4	55.0	48.4
Southeastern Power Adm.	8.4	1.7	1.4
Southwestern Power Adm.	9.0	6.0	7.0

Eisenhower Administration recommends Congress cut Interior and Corps of Engineers budgets substantially. The question: How hard will it push Congress to carry out the cuts?

Republicans last week stopped trimming and started slicing huge chunks from Interior Department's budget for fiscal 1954. Some of the big cuts are scheduled to be made in the department's sizable electric power program including both generation and transmission.

This was true too of the Administration's program over in the controversial area of the Army Corps of Enginers' civil functions budget. Republican economizers recommended halting construction on several big hydroelectric projects and deleting the only new start in the Corps' budget.

Overall departmental budget cutback on Interior has shrunk the $607 million figure recommended by the Truman Administration to some $403 million—the amount recommended last week by the House Appropriations subcommittee on Interior. Whether the low figure will survive through full House debate and Senate consideration remains to be seen.

If so, it would mean a reduction of some 33% below the Truman budget and more than 10% below the recently revised budget of the Eisenhower Administration.

Best guess is that the Senate will raise the House figure, and the end result will be somewhere near the amount requested by the new Republican Administration.

Department agencies dealing with electric power would be hard hit by the proposed reduction (See Table). Besides deleting all proposed new starts on hydroelectric and transmission projects of the Bureau of Reclamation, the reductions also calls for halting construction on several units of Missouri Basin development.

Interior Overruled

Bureau of the Budget overrode the department's proposal for a mere $6 million reduction in the $231-million Truman Reclamation budget. Instead the Budget Bureau, with the backing of the White House, imposed a whopping $29-million cut in the Reclamation budget.

Although the cuts in the Interior budget reflect the general trend of Administration and Congressional thinking, they do not give the full construction picture for the next fiscal year. One reason is that funds carried over from the present fiscal year will probably be used for construction next year.

Reclamation, for instance, has a $16 million "carryover" which must be added to both the Eisenhower budget figures and the House committee figures to get the full amount available for construction of power projects next year. Bonneville Power Administration "carryover" will add some $3 million to the revised budget figures for that agency. A smaller "carryover" is also available for use by Southwestern Power Administration.

Democrats are already calling the House committee recommendation "fake cuts." They say that more money will eventually be made available if the need arises, but the Republicans are using the meat axe treatment now to make way for a tax cut. President Eisenhower has said that a balanced budget must be in sight before a tax reduction is in order.

Following are the list of proposed new power projects which the Republican Administration has deleted:

Project	Installed Capacity	Truman Budget Fiscal 1954
American Falls (Wash.)	20,000 kw	$853,000
Roza (Wash.)	10,000 kw	881,000
Deer Creek (Utah)	5,000 kw	380,000

Project (transmission)	Capacity	Truman Budget Fiscal 1954
Camp Stoneman (Calif.)	Sub-station	60,000
Flatiron-Valmont	115 kv	388,000
Southwest Minnesota Line	230 kv	4,000,000
Yellowtail-Billings (Mont.)	115 kv	715,000
Sioux City-Omaha (Neb.)	230 kv	462,000
Gavins Point-Belden (Neb.)	115 kv	575,000

Interior Secretary Douglas McKay had recommended that the Deer Creek and Roza Projects be retained in his 1954 budget, but the hard-cutting Budget Bureau applied the hatchet. House appropriations subcommittee went further and trimmed funds from a number of projects that are already underway.

Squint Into 'Pork Barrel'

Although the Eisenhower Administration last week indicated a desire for a severe cutback on the Engineers' multipurpose dam program, Congress will have the final say on money available for this construction. It is not for nothing that legislation in this matter is sometimes called the "pork barrel" bill. In its revised budget, the Administration recommended that work be halted on these projects:

- Oahe reservoir in South Dakota, which has been the center of a heated controversy since early last year. Opponents have said the planned size of the dam should be reduced to prevent flooding out valuable upstream land. The Truman Administration had requested $14.8 million for construction next fiscal year.
- Table Rock Project in Missouri and Arkansas for which $10.8 million had been requested.
- St. Mary's river power plant in

Michigan for which $235,000 had been requested.

- Detroit Reservoir in Oregon for which $1.3 million had been requested.
- Dam B, which is part of the Neches-Angelina River development in Texas.

In conformity with its "no new starts" policy, the Administration also recommended deletion of the controversial Ice Harbor Lock and Dam in Washington. The Corps had previously requested $4.9 million for the next fiscal year to start on this project.

In addition, the new Administration urged slowdown of construction of a number of multipurposes projects already underway. Following are a list of the projects and a comparison between the original Truman Budget and the revised budget:

Project	Truman Budget (Millions of dollars)	Eisenhower Budget (Millions of dollars)
Gavins Point Reservoir (Neb.)	$17.8	$12.1
Garrison Reservoir (S. D.)	39.0	31.0
The Dalles (Wash.-Ore.)	58.4	37.4
Fort Randall (S. D.)	22.7	14.7
Cheatham Lock and Dam (Tenn.)	5.8	4.8
Old Hickory Lock and Dam (Tenn.)	18.0	12.6
Chief Joseph Dam (Wash.)	30.0	25.0

Planning funds for power redevelopment at Niagara Falls was cut from $989,000 to $100,000.

McKay Takes Issue with Hoover

Interior Secretary does not believe U. S. should get out of power business as soon as possible but he does want private industry to play a bigger role in hydro developments

Interior Secretary Douglas McKay takes a dim view of the suggestion that the federal government withdraw from the electric power business.

In several recent statements, he has reiterated his view that the federal government must continue to build the large multipurpose projects. Last week he again voiced opposition to disposal of any of the electrical properties operated by the government.

As head of the Interior Department, McKay has a big say in the Administration's power policies. He is directly responsible for marketing a major portion of the power sold from government-owned generating projects.

A Flat "No" . . . Asked recently if he agreed with the speech of former Republican President Herbert Hoover that the government "should get out of the business of generating and distributing power" as soon as possible, McKay replied: "No sir, I do not."

But on the details of the Hoover proposal, the new Interior Secretary's views were closer to agreement. Like Hoover, McKay believes in the need for more multipurpose projects. He also believes private industry should play a bigger role in development of the single-purpose hydroelectric projects and the transmission of power.

Retain Projects . . . Perhaps he departs from the Hoover doctrine when he holds the government should retain its power projects. McKay made the contention last week, arguing:

"These projects have been built with taxpayers' money. They are self-supporting, returning a good profit. And at the present moment, I don't know of any of them that should be sold."

But McKay does follow Hoover's lead in opposing more federal valley authorities.

Chief Joseph Dam Is Two-Thirds Above Water

Now more than two-thirds complete, Chief Joseph Dam on the Columbia River in north central Washington State will not change much from the picture above until the end of the high water season, expected in late June. With raising of the right-hand monolith of the 922-ft long spillway above water level, only four blocks remain below water level. These will be heightened after river flow diminishes.

The powerhouse and intake structures are rising downstream on the left, with concrete being placed at the rate of 2,250 cu yd per day.

The dam is scheduled to begin delivery of power by Sept. 1, 1955.

CONFERENCE CHAIRMEN (left panel) at Southeastern Electric Exchange Engineering and Operation Section meeting take time out for an informal talk. They are (l to r) S. L. Muths, Mississippi Power, conference vice chairman; J. M. Oliver, Georgia Power, conference chairman; and Lee C. McClurkin, Savannah Electric & Power, SEE president. Pictured in right panel are conference speakers: W. T. Hess, Louisiana P&L; H. J. Scholz, Southern Services; R. W. Sherwood, Gulf States Utilities; and E. X. Hallenberg, Westinghouse Electric

Speakers at SEE Engineering and Operation Section Conference urge . . .

Standardizing the Extra-High Voltages

The electric utility companies in the Southeast region should adopt a uniform extra-high voltage for bulk power transmission, according to H. J. Scholz, president of Southern Services, Inc. and W. T. Hess, vice president, Louisiana Power & Light Co.

They addressed the Engineering and Operation Section Conference of Southeastern Electric Exchange, held at Edgewater Park, Miss., April 16 and 17.

Scholz said that the sooner all companies in the region cooperate in this effort the more nearly will the goal be reached.

In commenting on Scholz's paper, R. W. Sherwood, Gulf States Utilities Co, said power companies may find ways to beam power between power centers and load centers by a method similar to the use of microwaves. He said that another possibility is high voltage dc transmission, which would increase tremendously the capability of present ac circuits.

In discussing engineering practices of European utility systems, C. W. Leihy, publisher of "Electric Light and Power," said that by international agreement, the European systems have adopted 380 kv as the standard super voltage. In practically every country new trunk circuits are now being designed either for immediate or eventual use at this voltage, he stated.

Consider the Customer . . . The prime consideration in answering a customer's want is to have the attitude that the want is sensible and reasonable, according to Ben Askew, Georgia Power Co. Regardless of whether you agree with him or his motive, such an attitude will keep you off the defensive and lead to a positive approach, he said. Defense leads to arguments, a positive approach leads to solution. The customer basically wants three things from you as his employee, Askew said. First, he wants a "can man" —one who can do things. Second, he wants a "when man"—one whose schedule he can follow, and third, he wants a dependable man.

Large scale heat pump applications have not been confined to office buildings, according to F. R. O'Brien, Southern Research Institute. He said that the 150-ton installations in the Sears Roebuck Store in St. Petersburg, Florida and Bullocks Department Store in Palm Springs, Calif., have performed in a very satisfactory manner for several years.

Safety men spend 95% of their time curing 5% of the accidents, in the opinion of Justin Wilson, Justin Wilson & Associates. He said that there are three basic components of safety—self preservation, love thy neighbor, and know your job (be properly trained). Safety is the best public relations you can get anywhere, he said.

In describing the overhead system development plans utilizing 22 kv for a distribution system in Wilmington, N. C., J. W. Hunter, Carolina Power & Light Co, and J. A. Salin, Ebasco Services, said that with maximum loading of 10,000 kva per 22-kv circuit a feeder would carry double the load with only 59% of the voltage regulations as compared with a 12.47-kv system with 5,000 kva loading. They stated that 23-kv wye is the correct distribution voltage for a close-to-the-ocean city.

In the opinion of C. M. Stallings, Virginia Electric & Power Co, banked secondaries economically solve the problems of poor voltage regulations and lamp flicker in areas where load density is not great enough to justify the expense of underground or overhead networks. He said that conventional transformers with fuses connected in the secondary mains would be most economical, but greater service reliability may be realized through the use of banking transformers with

self-contained primary protective links and secondary circuit breakers.

Improving Relations . . . Mounting opposition to the granting of rights-of-way is being experienced by Missisippi Power Co because of the increased importance of reforestation in its service area, said A. J. Watson, Jr, Mississippi Power Co. He suggested that an agreement on an annual rental basis instead of an easement for a lump sum has many advantages. J. E. Kizzire, also of Mississippi Power, said a rental agreement would improve relations with land owners and allow utility companies to obtain rights-of-way more economically.

There is a growing need to supply the reactive kva at the secondary location insofar as possible without switching, in the opinion of K. S. Field and J. A. Salin, Ebasco. They said a recent survey indicated that about 3% of the total kvar of static capacitors now installed by SEE member companies who reported that they are using or are planning to use secondary capacitors is in secondary units. This type unit will comprise 20% of the total scheduled for installation during 1953, they declared.

Utility managements might find it profitable to take another look at the economies of developing hydro power in their areas, particularly from relatively small streams, according to H. H. Gnuse, Jr, vice president of Nantahala Power & Light Co. He said recent advancement in design of dams and electrical controls has reduced construction and operating costs to such an extent that development of many small hydroelectric projects should now be economically feasible if all frills are omitted.

Chlorination has developed into the most economical and widely accepted method of cooling water slime control, in the opinion of S. A. Cole, Wallace & Tiernan Co, Inc. He said that the importance of "free" chlorine residual in a treated water cannot be overemphasized and, when checking a slime control treatment, this residual should always be used.

L. B. Murray and C. P. Ussery, Alabama Power Co, presented a study of cost of high voltage transmission lines in Alabama using wood and steel structures. Murray pointed out that the wood, or combination of wood and steel structures, is more economical than steel towers for 230, 287 and 330 kv.

NW Interruptible Loads Cut

Light spring runoff and cold weather combine to reduce hydro output. Steam plants, imports supplement power supply

Pacific Northwest Power Pool operation in April duplicated the critical September-January period with peaking deficits forcing curtailment of interruptible loads and sudden dumping of energy to meet emergency overloads. Blame again fell upon rapidly lowering streamflows.

What was happening at the tailend of the hydro storage season when streams normally begin to rise was another freakish twist of weather. To a degree it was expected. Light snow cover on the lower mountain elevations indicated a light spring runoff. But a cool weather spell compounded the problem by holding back the melt and raising loads for heating.

Steam Power, Imports Used . . . Pooling arrangements read like a repeat log of last winter. Steam plants and imports have been called upon to supplement hydro facilities to maintain a 3,266,000 kw average load and 4,268,000 kw peak as the month began. By pulling down storage, hydro contributed 3,801,000 kw to the peaking load; steam turned in 176,000. Montana imports added 141,000 and British Columbia Electric Co 129,000. Miscellaneous resources chipped in 21,000.

This peak was a net after dropping a portion of interruptibles from hydro and carrying the industries, mostly aluminum, on steam. But April 13 the peaking load became too heavy and Bonneville Power Administration was forced to cut off 150,000 kw from customers for a few hours to avoid pulling apart the regional network. BPA said similar prorated cutoffs could be expected until normal spring runoff starts, perhaps later in the month.

Slightly Below Normal . . . Current Columbia basin snow pack surveys and streamflow forecasts show water supply outlook is slightly below normal. Spring runoff will be the lowest in the main stream of the Columbia in eight years. Runoff for the whole season will be 90% of normal.

At the river forecasting center in Portland, the weather bureau's men are wary of predictions beyond the slightly below normal. But the men at Bonneville Power Administration make a preliminary 90% forecast—and add "it's another dry year."

On the brighter side is fact that hydro generators have been added to the Columbia system at a rate which far exceeds normal load growth. And a number of large hydro units are slated for operation in 1953-54.

FBI Is Investigating Joppa Explosion

Federal Bureau of Investigation has been called on to find out if sabotage caused boiler explosion April 11 in the 156,000-kw unit Electric Energy, Inc, was preparing to put on line at its Joppa (Ill.) Plant. (EW, April 20, p 115). Plant will supply power to Paducah atomic plant.

Electric Energy Vice Pres Turner White said last week: "Unquestionably there was sabotage involved. No other conclusion can be drawn from number of acts involved."

He listed these suspicious circumstances: There were pipe hangers and scrap iron in coal pulverizing mills. Two mills shut down almost simultaneously. Feeder gate on third mill stuck open. All troubles occured within 20 minutes. Feed water pump tripped off without apparent reason. Second wouldn't start because a valve had been tampered with.

Damage caused by the blast has been repaired and Electric Energy expected to light the boiler of the unit last week to dry it out.

THE ELECTRICAL WEEK

CONTINUED

Plan to permit industry to own and operate atomic power plants is opposed by the CIO. Pres Walter Reuther said his group favors continuing the federal monopoly on fissionable materials and reactors. The American Public Power Association said the changes in the law should provide safeguards against "any monopolistic advantage accruing to any private persons or corporations."

"More Power from Niagara" booklets are available without cost from "More Power from Niagara," Niagara Falls, N. Y., and not from "More Power To America" as stated in the April 13 issue.

Pennsylvania P&L, with over 75,000 stockholders, had 83% of its 5,035,761 shares voted at its last meeting.

The government is out of the metal market for two months at least as the result of an order from the White House. The Defense Materials Procurement Agency will make no more long-term purchase contracts under its 41 minerals expansion program until it gets further orders.

IN THE INDUSTRY

Slowly the industry is again turning to its employees as a market for its common stocks. Of the two reasons for the change the first comes from the employees. With steady employment at high wages the workers have money to invest. Realizing the bright future for their companies and knowing how dividends and stock prices have been rising in the past decade, they naturally consider their companies' stocks a safe and lucrative investment.

The second reason comes from the companies themselves. If they are to continue to expand, they must sell more stock (In the Industry, April 13). If the stock must be sold, why shouldn't the employees as well as the public buy it. Some companies have made stock available to their workers. But others, remembering the depression when employees who had been encouraged to buy stock became disgruntled when it toppled, hesitate to promote such sales. To such companies two similar stock selling plans have been made available.

The one plan is the Potomac Plan by which the public including employees of the Potomac Electric Power Co buy common stock on the monthly payment plan. The other is the Share a Month Club by which employees of the Virginia Electric & Power Co buy shares of its common through a trustee. Both plans stress systematic saving and make possible purchase of as little as a fractional share a month. The plans have no connection with the utilities. However, Vepco will make payroll deductions for its employees.

Potomac Plan . . . In 1950 Charles R. Connolly, a Washington investment man, impressed by the savings of workers who regularly purchased E bonds during the war, set up the Capital Reserve Corp (He is said to own 45% of its outstanding voting stock.) which sponsors the Potomac Plan.

Here is how it works. Hamilton National Bank is custodian for the plan. It receives all deposits, purchases the stock, mails deposit reminders and progress reports, and handles the accounting. A prospect chooses an objective (the amount he wants to save in five years) ranging from $1,200 to $15,000 and with monthly payments ranging from $20 to $250.

The investor merely sends his deposit to the bank which does the rest. Dividends are reinvested in Pepco stock without additional costs. All shares are held in safe-keeping by the custodian. Upon completion of the objective the shares are delivered to the investor who gets future dividends directly. An investor can drop out anytime though he may lose money if the market is low.

Fees for sales and administration vary from 9.1 down to 4.2% with deductions for the largest part of the total costs coming out of the first 12 deposits. This is substantially higher than the cost of purchasing the stock on the market or buying investment trust shares.

Share a Month Club . . . The plan for Vepco employees differs slightly. The agreement is for three years, and the First and Merchants National Bank of Richmond serves as trustee. After an employee has authorized a monthly payroll deduction, the bank takes over. It buys stock up to the amount of the employee's account which is also fed by any dividends. The bank holds the stock but issues periodic reports on each account. The plan terminates if the investor leaves Vepco. It can also be terminated under reasonable restrictions.

Compensation for the trustee is 3% of all monthly payments into the fund and 5% of all dividends.

But for employees there is no doubt that the most favorable plan is one similar to that of Philadelphia Electric Co. It plans to offer on June 2 a 100,000 share block of common to employees at 85 to 95% of the going market price.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Natural-draft cooling towers will be used with nearly half the total postwar generating stations in Great Britain. Water temperature is generally lowered 12 to 15 degrees F at an evaporation loss of less than 1%. Ten degree cooling of 1,800,000 gallons per hour takes a tower 180 feet in base diameter and 136 in height.

High duty switchgear allows higher fault levels and thereby permits heavier and more closely knit tie capacity with system investment economy as a result.

Internal-corona knowledge along with facts about switching surge phenomena will determine how far low frequency test prescription can be lowered for transformers to match the lowered BIL values.

Recording instruments may be relegated in part to the rear of operating boards but not eliminated. They obviate many hourly log readings that are plain drudgery.

Spare motor-driven exciters could well be chosen oversize to meet the inevitable increase in plant capacity and thus match the enlarged size of units.

High resistivity dust may give more trouble in electrostatic precipitators than high conductivity dust. The voltage gradient may rise above breakdown value and the negative corona will partially neutralize the positive charge imparted to the dust particles.

a full measure of metering dependability

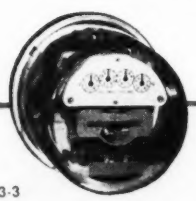
Sangamo J Meters

Just as the Standard Cell and the Potentiometer are the basis of all precise laboratory measurements of electric energy, so is the Sangamo Type J meter a precision commercial instrument on which Utilities may equitably base their charges. The meter is an implement in the sale of electric power—the return on your investment.

Sangamo Type J Meters are designed to operate with high accuracy for many, many years. Each mechanical part is doweled so its position cannot shift, even under extreme vibration or through temperature changes . . . Magnetic gaps are fixed . . . The calibrated accuracy of Type J Meters is exceptionally stable. Sangamo's program of special anti-corrosion treatment of parts and selection of materials prevents meter deterioration on outdoor installations, even in severely corrosive atmospheres.

Careful attention to those performance characteristics most needed by electric utilities to measure accurately customers' loads with minimum maintenance has always guided the design and manufacture of Sangamo meters.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS



Only Measured Facts are Known Facts

JM53-3

ALLIS-CHALMERS

MULTI-CIRCUIT

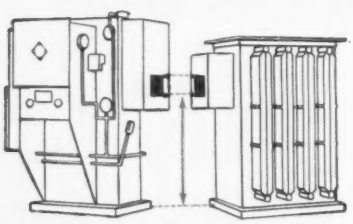
Unit Substations

For Easy

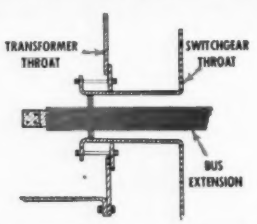
TRANSFORMER INTERCHANGE

Install A-C Unit Subs That Can Be Expanded to Keep Pace with Your System Growth

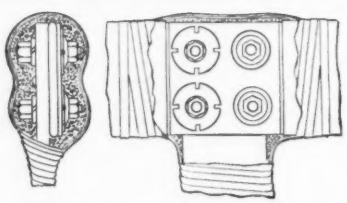
Here's Why Transformers Are Easy to Change



1 **A HIGHER CAPACITY TRANSFORMER** —within the limits of breaker size and bus capacity — can easily replace the installed transformer. Substation design permits one transformer to be replaced by another of larger rating easily and simply in the field.

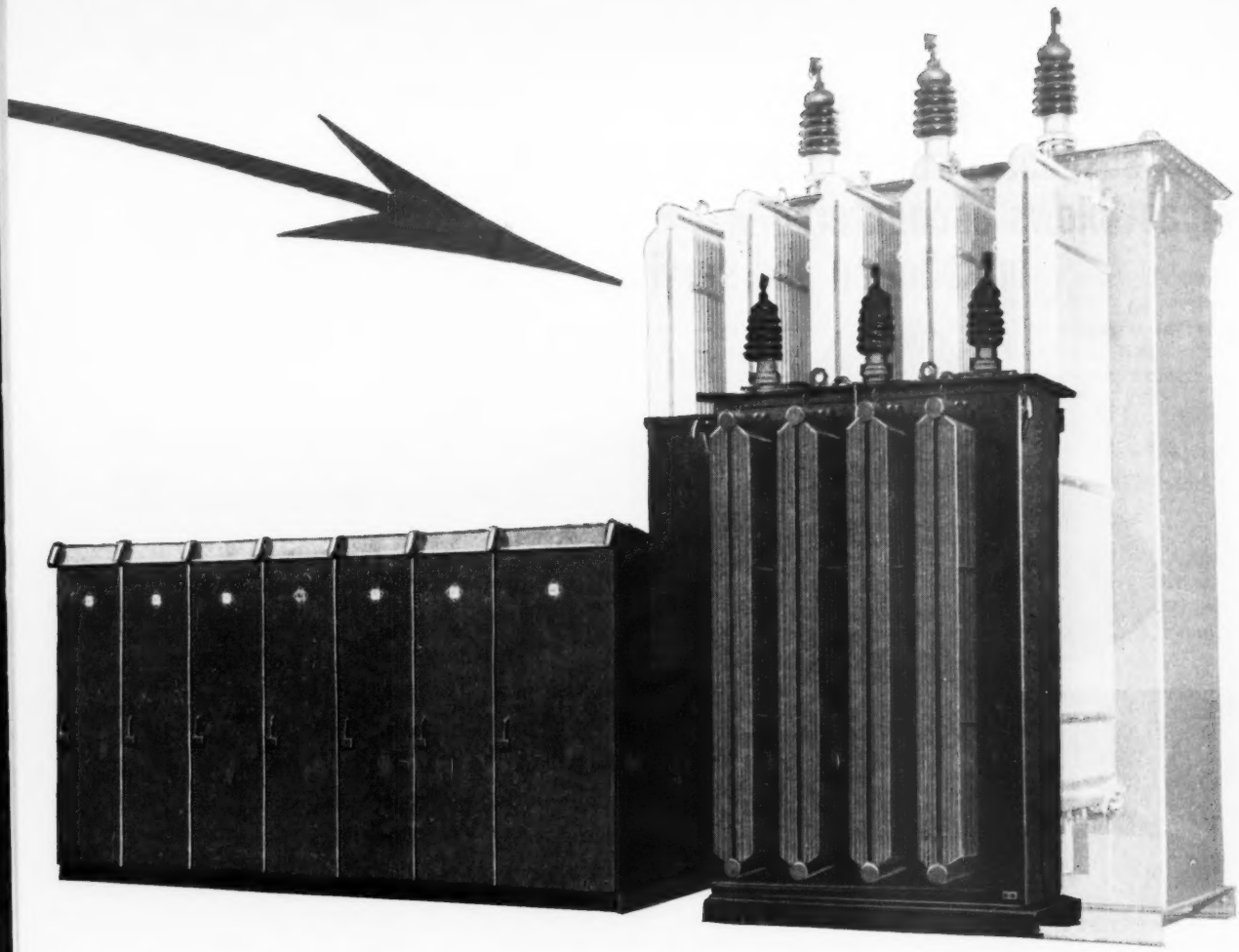


2 **FLEXIBILITY** to meet field conditions is built into the throat construction of Allis-Chalmers Unit Substations. Because of this, mechanical and electrical connections are easy to make. Normal irregularities in concrete surfaces affecting alignment can be tolerated.



3 **BUS JOINTS** are easy to make in the field. Bus extensions are predrilled and silver plated . . . designed for quick, easy bolting together. No-corona tape covers the bolted joint. Insulating tape finishes the joint. There's no compound to melt or apply.

ALLIS-



WHEN LOAD GROWTH demands additional power, the Allis-Chalmers Unit Substation you install today will be easy to modify. The installed transformer will be easy to replace with a new transformer of larger capacity.

Simplified Mechanical Connections Cut Changeover Time

Your service crew will find fewer connections to make — and these at a lower, more convenient level than the connections of most piecemeal substations.

Throat locations have been carefully established so that an Allis-Chalmers substation transformer of any rating can be replaced by a larger one. Bus and throat connections have sufficient flexibility to permit realistic tolerances for pad construction.

The time interval for changeover is further reduced by the use of bolted and taped bus joints to speed up electrical connections. Time is saved because there's no compound to melt, chip, or scrape.

Because Allis-Chalmers Unit Substations are designed to grow with your system, they are a convenient answer to the growing distribution problem . . . to the ever increasing demand for power and yet more power. They are simple to specify, neat and modern in appearance, and easy to expand.

You Save These Five Ways

(1) Original equipment cost is low; (2) compact construction reduces space requirements and real estate costs; (3) pre-wired unit design speeds installation; (4) maintenance is quick and economical because of improved accessibility; and (5) you purchase only the equipment you need *now*, deferring additional expense until load growth demands the expenditure.

For the full story on what Allis-Chalmers Unit Substations can mean in your distribution system, call your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-3807

CHALMERS

A-C ALLIS-CHALMERS

a Transmission Engineer Asks—

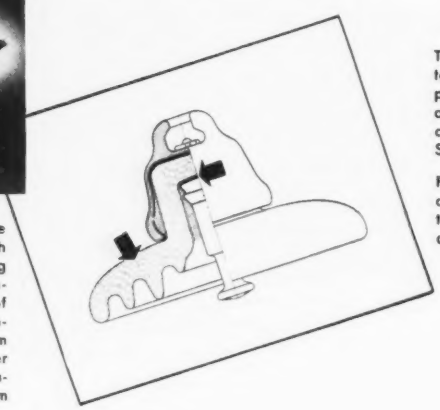
"How do PINCO 1060 suspension units stand up under impact blows encountered in installation and service?"

NO. 11 IN A SERIES

.....here's our Answer:

The ability of Pinco Suspension Insulators to withstand severe impact blows is attributed to the *rugged design of the porcelain body*, wherein the proper distribution of porcelain at critical points plus beaded edges produce a huskier section of sufficient strength to provide *extra* protection from impact blows encountered in installation or service. Additional protection is also provided through the use of a resilient pad between the porcelain and the top end of the pin. The cushioning action of this pad protects the porcelain from damage by impact on the end of the pin and relieves any stress which might occur.

Pinco Insulators of every type are continually subjected to tough laboratory tests approximating all possible conditions encountered in actual service. Typical of these is this routine test for impact strength made on random samples from production. Another example of Pinco's careful watchfulness over every detail, from design to completed product.



This sectional view of a Pinco 1060 Suspension Insulator shows its rugged design characteristics and husky porcelain section. Note location of resilient "shock absorbing" pad between pin and porcelain . . . another protective feature built into every Pinco Suspension Unit.

For complete electrical and mechanical specifications covering the Pinco 1060 Suspension Insulator, refer to page 65, Pinco Catalog No. 49. If you don't have a copy—write us.

The Porcelain Insulator Corporation LIMA, N. Y.

Sales Agents: JOSLYN MFG. AND SUPPLY CO. *Offices in Principal Cities*

Suspension Insulators . . . Clamps and Fittings . . . Switch and Bus Insulators . . . Distribution and High Voltage Pin Types . . . Guy and Tree Insulators . . . Special Porcelain.

PINCO INSULATORS

RIGHT ON THE JOB—

Export Ban Fails

Bills to prevent sale of power needed in California to other states are blocked

Last minute opposition from southern California interests has blocked legislation designed to prevent exportation of power outside the state.

One bill was intended specifically to prohibit Central Valley Project power from being wheeled to Nevada and a second measure would have provided that in any future power development projects in California the energy must be used in the state unless there was a surplus. It also would have provided that if it was transmitted for use outside the boundaries of California permission would be conditioned as to terminate the agreement when the power was needed in California.

The opposition did not develop until after each house of the legislature had passed its own bill. In view of the oppostion, further action on legislation was considered unlikely. Gov Earl Warren told legislators it would be difficult for him to sign such legislation.

Reciprocity Feared . . . Representatives of the County of Los Angeles were the first to call attention to the fact restrictions on power could work both ways and California, looking to the future for possible power from the Pacific Northwest or from future developments on the Colorado River, might be harmed more than benefited if reciprocal barriers were set up by other states. One official expressed the fear it might work a hardship on California when it came time for discussions of a renewal of the contract for power from Hoover Dam.

Introduction of the power exportation ban legislation resulted from the signing of a contract between the United States Bureau of Reclamation and the Colorado River Commission of Nevada for the delivery of 30,000 kw of CVP power to the state of Nevada.

However, the contract will be null and void if the Nevada agency cannot make arrangements by June 30th to wheel the power from the bureau installation at Tracy, Calif.

This would require use of the Pacific Gas & Electric Co and Southern California Edison Co transmission facilities.

The legislature has adopted a resolution urging the two private power firms to deny use of their lines for the wheeling arrangement.

This directive from the legislature will give the power companies a strong position in refusing permission to use their lines.

Bureau officials concede it is virtually impossible for the Nevada commission to meet the condition by the deadline.

POWER BRIEFS

• Six months extension until Aug. 31 has been granted the County of Placer, Calif., on the permit issued them for a proposed hydroelectric plant on the North Fork of the American River. Plant will be located near the North Fork Debris Dam.

• Thirteen dams would be part of the development of the Moselle River, now under consideration by the governments of France ,West Germany, and Luxembourg. The $100-million project in addition to supplying local power needs would open the river to navigation giving easy access to Coblenz and Atlantic ports for Lorraine iron ore and coal from the Saar.

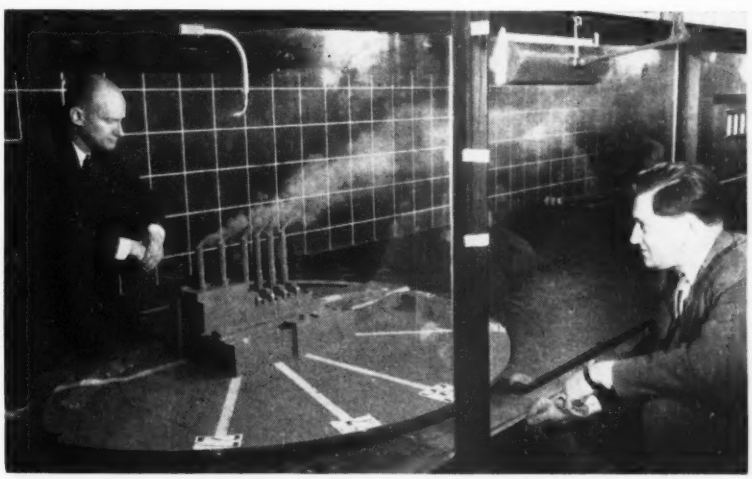
• John W. Davis, former Democratic presidential candidate who has handled a number of important utility cases, celebrated his 80th birthday anniversary by receiving the highest civilian decoration that Great Britain can bestow upon a U. S. citizen.

• Two-year extension of preliminary permit to PUD No. 1 of Lewis County, Wash., for proposed power project near Packwood has been granted by Federal Power Commission.

• Geological survey shows Oregon coastal streams are capable of producing 200,000 kw of firm power.

• Seattle City Council is considering a new 20-year contract with Bonneville Power Administration to replace present agreement which still has four years to go.

• Four windmills each equipped with three 30-ft blades are being built to supply the electricity needs of the hamlet Pont Yblon (population 160) near Paris.



Plant Model Is Weather-Tested

Model of Cleveland Electric Illuminating Co's Avon Plant is being put through a series of exhaustive tests in the wind tunnel laboratory at New York University's College of Engineering. Unusual weather conditions are created in the tunnel so operating procedures to meet them can be studied. Fred Leonhard, CEI engineer who is coordinating tests at the university, is shown inside the tunnel as Dr Gordon H. Strom, university research project director, supervises the operation. A model of the company's new Eastlake plant also is being tested at the laboratory.

Members of heat pump class study new model undergoing tests on 100-ton calorimeter in Air Conditioning Division laboratory

Through the South, a new heating-cooling unit is available. So now, at GE's Institute, they're . . .

Spreading the Word on the Heat Pump

Twin keys to the residential heat pump market are the dealer and the electric utility.

That's what General Electric Co is telling students of the new heating-cooling unit at the Heat Pump Institute in Bloomfield, N. J. Week-long classes began there in March to acquaint dealers, distributors, GE personnel and utility employees with the pump's operation and promotion.

Paul O'Neill, manager of utility contacts, recently told one training group that dealers were being urged to inform the power company before making installations. This so the utility can decide how it can serve the load, meter the pump, and work out other technical details.

"We're working closely with utility people," he said, "to help plan and promote 'All Electric Living'. The heat pump fits the pattern well."

"All electric?" one of the students asked. "Well, yes, except for air," an Institute instructor told him. The heat pump, he explained, works much like a reversible refrigerator. To cool, it extracts heat from indoor air the same way a conventional refrigerator extracts heat from inside the box and discharges it outside. To heat, it reverses automatically, extracting heat from the outside air.

Units (installed price between $3,500 and $4,500) are being sold first throughout the South, O'Neill said, because Southerners are already "cooling-conscious." Nationwide distribution looks to be several years off. Edison Electric Institute figures show a total of 1,054 units (both GE and Westinghouse models) had been installed as of March 4.

Classes done, the "student body" tours the plant to see how the instrument is made. Then, GE sales engineers hope, trainees go home with a better idea about how the heat pump will fit into electrical development of their areas.

Week-long school program acquaints "students" with the pump

1 Utility men, engineers, distributors and the like start classes early Monday morning at GE Heat Pump Institute. George K. Marshall, above, manager of commercial engineering in the department, is in operating charge of the Institute

2 Three men from southern utilities look over "breadboard" on which parts of an operating heat pump are exposed. Unit "conditions" classroom

3 The pump is interesting enough to be chief topic at daily luncheons in the plant. Here, GE's Paul F. O'Neill, left, talks with Arthur C. Crawford, Potomac Electric Power

4 Tour of plant shows group how heat pump is assembled. William Cox, manager of product planning, explains the workings of a machine that stacks fins on the air coils. Trip down assembly line followed

5 New models will be coming off the line soon—this is where they get their start. Draftsman told the group eight-board heat pump section has been working six days a week with overtime

6 After five days of classes, homework and "lab" sessions, trainees receive a certificate attesting their knowledge. Above, Marshall gives one to George G. Rosato, Standard Brass & Mfg

Engineer's Role . . .

. . . in cutting unit costs will assume greater importance in future, public power group told

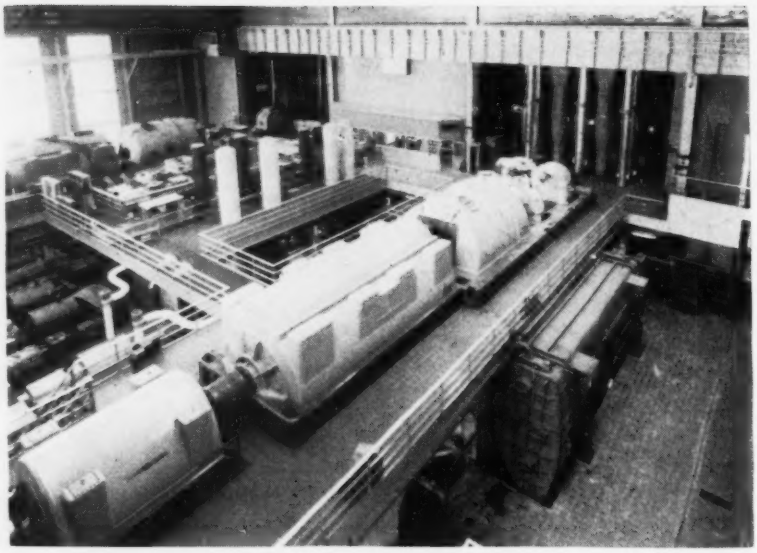
Engineer's role in the future will assume greater importance in reducing unit costs, said Sol E. Shultz, chief engineer, Bonneville Power Administration, before the Engineering and Operating Section of the Northwest Public Power Association which met April 16-17 at Eugene, Ore.

Three times as much energy will be produced in 1970 as in 1950, Schultz pointed out. Problems of expansion, mounting unit costs, building in congested areas, and higher distribution voltages will confront the engineer. In 1957, BPA will use capacity equivalent to Bonneville Dam to meet system losses, he said. If engineers can devise ways to cut these losses only 10%, this will represent 50,000 kw of additional capacity, the BPA engineer declared.

Protective Devices . . . Coordination of distribution protective devices was discussed by D. E. Hughes, PUD No. 1 of Cowlitz County, Wash. He pointed out that extremely inverse overcurrent relays will help protect fuses damaged but not blown by heavy fault currents. Otherwise, they may isolate circuit on subsequent faults below their rating. Use of instantaneous first-shot and 80-sec time delay on reclosing relays serving oil circuit breakers, he said, will protect and coordinate high-side substation fuses with customer loads. But, it was cautioned from the floor, long-time delays may be hazardous to anyone attempting to handle fallen lines between reclosures of automatic equipment.

New procedure for field testing meters involving use of a truck was described by J. D. Cockerell, Tacoma City Light. In 1952 the vehicle travelled 2,094 miles and four-man crew tested 12,976 meters at labor cost of $1.23 per test. This compares with $1.56 per test before the truck was used, he said. Meters tested rose from 36 to 51.7 per day after unit was put into operation.

Section members voted to set up metermen schools at Oregon State College, Corvalis, Ore., and State College of Washington, Pullman, Wash. Five-day course would cover principles of alternating current and fundamentals of shop practices.



First 1,100 F Turbine-Generator

The first 1,100 F turbine-generator in the world has been put into service by Public Service Electric & Gas Co at its Kearny generating station. Using steam at 2,350 psig with reheat to 1,050 F, the 145,000-kw tandem-compound unit (above) is the largest 3,600-rpm machine in operation. The second unit is scheduled to go in service later this year.

Steam is supplied by a single semi-outdoor, 950,000 lb-per-hr boiler. The boiler has controlled circulation and a pressurized furnace. It will burn, under full-load conditions, approximately 48 tons of pulverized coal or 220 bbl of fuel oil per hour.

Each turbine-generator is designed to produce 1 kwhr from 2/3 lb of coal—the most efficient generating installation in the Public Service E&G system.

Electric generation is at 20 kv. The generator windings have hydrogen cooling at 30 psig for maximum output. Capacity of both generators will be available through four 100,000-kva, 20-138-kv transformers in the adjacent switching station for the transmission lines.

California Utility Charges IBEW with Unfair Acts

Southern California Edison Co on April 14 lodged unfair labor practice charges with National Labor Relations Board against Local 47, International Brotherhood of Electrical Workers, AFL, which has been on strike against Southern California Edison since March 10.

Edison charged the "union has refused to bargain collectively and in good faith unless the company agreed to bargain on matters which it was not obligated to include under its agreement with the union, or under the law."

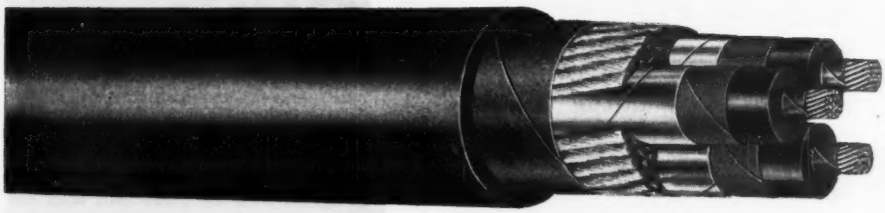
The complaint did not spell out what these matters were. It is understood that they involve contract interpretations not concerned with the union shop issue which has been the chief point of difference between company and union. Wages are also an issue in the dispute.

Edison also accused the union of delaying tactics during the period of negotiation before the strike, and of making "effective collective bargaining impossible" through its conduct since March 10.

A final charge was that the union has infringed on rights of employees in violation of Section 7 of the Taft-Hartley Act.

The union had previously brought charges before NLRB accusing the company of refusal to bargain in good faith, and of coercion and interference with employees (EW, April 20, p 105).

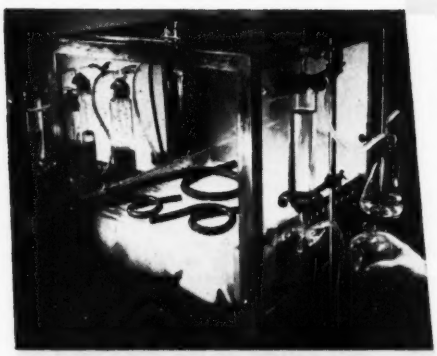
As of last week the strike was continuing without sign of a break. Edison has reported a substantial back to work movement. IBEW has denied the report.



4 AWG Stranded 3/C RoZone insulated, shielded, RoPrene sheathed power cable, 5000 Volts.

Rome RoZone®

Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE



How Rome Cable Tests Ozone Cutting
Ozone resistance of insulating compounds is determined in an ozonizer. Specimens are subjected to ozone atmosphere of prescribed concentration. To see what happens note specimens below.

What Ozone Does to Cable Insulation

Unretouched photo of conventional rubber specimen after short-time ozone test.

Unretouched photo of RoZone specimen after long-time ozone test.

It Costs Less to Buy the Best

RoZone is approved and accepted by leading utilities, industrials and consulting engineers.

What Its High Ozone Resistance Means to You

Q: What is ozone?

A: Ozone is activated oxygen, a gas resulting from corona discharge, a phenomenon in the distribution and generation of high voltage electricity.

Q: How does it affect cable insulation?

A: Ozone, an enemy of conventional rubber compounds, causes accelerated cracking and embrittlement of cable insulation. The result . . . early cable failure.

Q: What does RoZone's high resistance to ozone mean to you?

A: First and most important, it protects you against cable failure due to ozone cutting . . . assures you of long-time dependability of service. With the power and control cables amounting to as little as 1 or 2 per cent of total generating station investment, you cannot afford to risk shut down of facilities by sacrificing insulation quality.

Further, RoZone is a type of insulation which has behind it better than 75 years of dependable performance. By independent laboratory tests, it exceeds all industry specification requirements.

While ozone cutting is a natural hazard of high voltages, low voltage failure is often traced to ozone cutting because of adjacency to rotating equipment or high voltage lines. RoZone, therefore, is your best protection *regardless of voltage classification.*

Approved by the country's leading consulting engineers for its well-balanced properties, RoZone merits your confidence for all high and low voltage work where dependable, long service life is paramount. We will be glad to send independent test data upon request.

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ROME CABLE ROME, N.Y.

Integration Study Fizzling Out

Republican Administration has no great desire to push SEC program proposed last year by Chairman Donald Cook

The Republican Administration and Congress are shelving plans for a comprehensive government study of the nation's electric systems with a view to recommending more economical organization,

Securities and Exchange Commission, under Chairman Donald C. Cook, began laying groundwork for the studies last summer (EW, Aug. 18, 1952, p 8). Cook's idea was to take a look at the existing operating systems and recommend possible ways of integrating facilities or management into more efficient and economical combinations.

A five-man section was set up within SEC to draw up a program for conducting the studies. It has been working since last August, and has made one or two reports to Cook.

Interest Dying . . . But in the meantime, interest in the widely heralded studies has flagged. A new national administration has taken over, and present economy drives point to the elimination of the Cook plan for the time being.

At hearings before a House committee last month, Commissioner Richard B. McEntire said the work had merit, but added: "Our economic limitations make it impossible for us to do it now." McEntire, a Kansas Republican, is a prospective chairman of SEC. He made no enthusiastic plea for the continuance of the studies underway.

Supposedly McEntire was talking for the Eisenhower Administration when he said further, "We see no prospect of expansion (of this work) beyond present confines under existing budgetary restrictions."

Budget Consideration . . . It is certain that Congress will pare down any budget request for studies and investigations relating to integration of electric systems. Such studies are authorized under Section 30 of the Public Utility Holding Company Act, but without funds they cannot be carried on.

But even before the Republicans stepped in, these Section 30 studies were on the way to being shelved by the Democrats. The Truman budget had made no provision for expansion of the studies beyond the preliminary start made last year.

Chairman Cook may have gone to Congress with his plea. But with his resignation now on President Eisenhower's desk Cook has little voice in the future work of SEC.

Cook's proposal had previously come under fire from both private and public utilities and the Federal Power Commission (EW, Sept. 22, 1952 P 114). These attacks had not deterred him from going ahead with the preliminary studies. But with Cook's departure, the studies have no stout defender at SEC.

50-Mile Submarine Cable to Be Laid by Sweden

The world's longest submarine power line, a 50-mile cable for transmission of 100-kv direct current from the Swedish mainland to the Baltic island of Gotland, will be laid this spring and summer. The line will cost about $4.5 million.

The cable will make lower power costs possible on the island since hydroelectric power from the mainland will be utilized rather than steam power now generated on the island.

The State Power Board project calls for construction at Västervik on the mainland, of a station for transforming alternating current from the north of Sweden into 100-kv direct current. The cable will run from this station under the water to another plant south of Visby, only city on Gotland, where the power will be converted into 30-kv alternating current for local distribution. At the Visby station a large synchronous condenser will be installed to control the transmission and regulate the frequency and tension on the Gotland network.

Return current will be conducted to the mainland through the water and sea bottom by means of two electrode installations, placed at a safe distance from the cable route in order to avoid corrosion. Special channels will be blasted in the rocky shore on the mainland and on Gotland for the safe anchoring of the cable.

Two British experts will observe the work this summer in connection with plans to interconnect Britain, France.

Changes in Capacity Reported to FPC

PLANT ADDITIONS DURING FEBRUARY

State	Utility	Plant	Fuel	Capacity (kw)
Pa.	Pennsylvania Electric Co	Front St.	S	16,650
Pa.	Duquesne Light Co	Elrama	S	80,000
Ill.	Central Illinois Public Service Co	Hutsonville	S	60,000
Ill.	Sanitary District of Chicago	S. W. Treatment	S	10,000
S. D.	Faith Power & Light Department	Faith	IC	200
Kan.	St. Francis Water & Light Department	St. Francis	IC	860
Kan.	Stafford Municipal Power Plant	Stafford	IC	900
S. C.	South Carolina Electric & Gas Co	Columbia	H	1,300
S. C.	U. S. District Engineers	Clark Hill	H	40,000
Ga.	Georgia Power Co	Sinclair Dam	H	45,000
Fla.	Gulf Power Co	River Junction	S	40,000
Fla.	Vero Beach Municipal Power Plant	Vero Beach	IC	2,875
Tenn.	Tennessee Valley Authority	Johnsonville	S	112,500
Idaho	Washington Water Power Co	Cabinet Gorge	H	50,000

PLANT RETIREMENTS DURING FEBRUARY

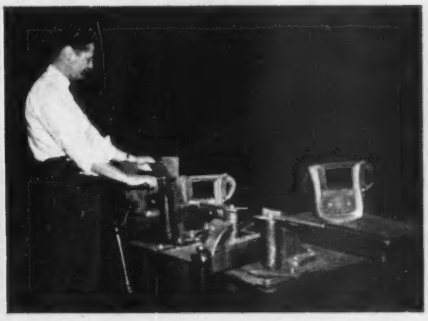
Ind.	Portland Light & Power Department	Portland	S	1,000
Mich.	Edison Sault Electric Co	Mackinac	IC	50
S. D.	Rosebud Indiana Agency	Rosebud	IC	218
Kan.	Kansas Power & Light Co	Mittonvale	IC	60
Kan.	Western Light & Telephone Co, Inc	Downs	IC	200
Md.	Eastern Shore Public Service Co	Princess Anne	IC	252
Colo.	Sangre De Cristo Electric Association	Bueno Vista	H	150
Calif.	Los Angeles Department of Water & Power	Adams Auxiliary	H	2,400
Calif.	Los Angeles Department of Water & Power	Adams Municipal	H	5,000

H—Hydro, IC—Internal Combustion, S—Steam
United States Capacity as of March 1—Hydro, 20,635,500 kw; Internal Combustion, 2,114,086 kw; Steam, 60,067,199 kw; Total, 82,816,785 kw.

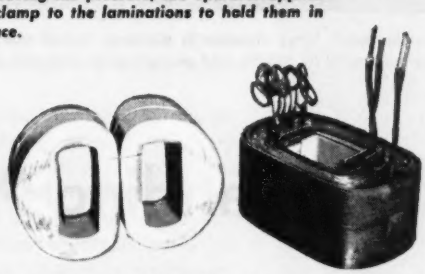
HOW KUHLMAN BENT IRON CORES ARE MADE

By way of celebrating a 20th anniversary, this brief picture-story shows the present-day manufacture of the now famous Kuhlman Bent Iron Core. The patent on this efficient core, (no. 1,933,140) was granted in 1933—yet so advanced was its design that today its essential characteristics remain the same and have influenced the design of many makes of transformer cores.

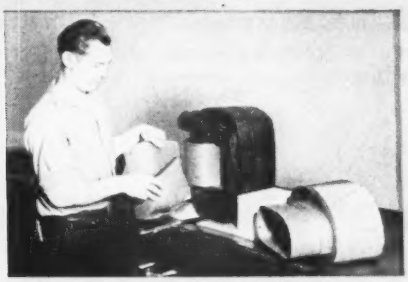
First, the laminations are cut to size and stacked. The operator clamps the stacks onto a hydraulic folding machine which bends them over a form into a U-shape. Before removing the pressure, the operator applies a clamp to the laminations to hold them in place.



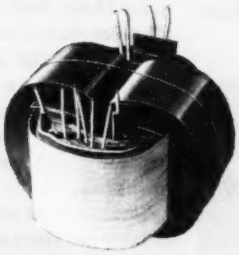
Another operator completes the bending by overlapping each alternate lamination. Levers on each side of the vise hold down each lamination as it is folded into place. The inner laminations have been cut shorter so that the outer ones will overlap.



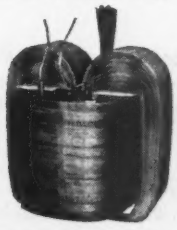
After the cores have been bent they are bound with wire and annealed to relieve the stresses caused by bending. Here are two annealed Bent Iron Cores next to the coil to which they will be assembled.



The assembler has disassembled a core and is now filling the coil lamination by lamination. The laminations retain their shape because they have been annealed. As soon as he has assembled a core to the other side of the coil, he will bind the whole assembly tightly together.



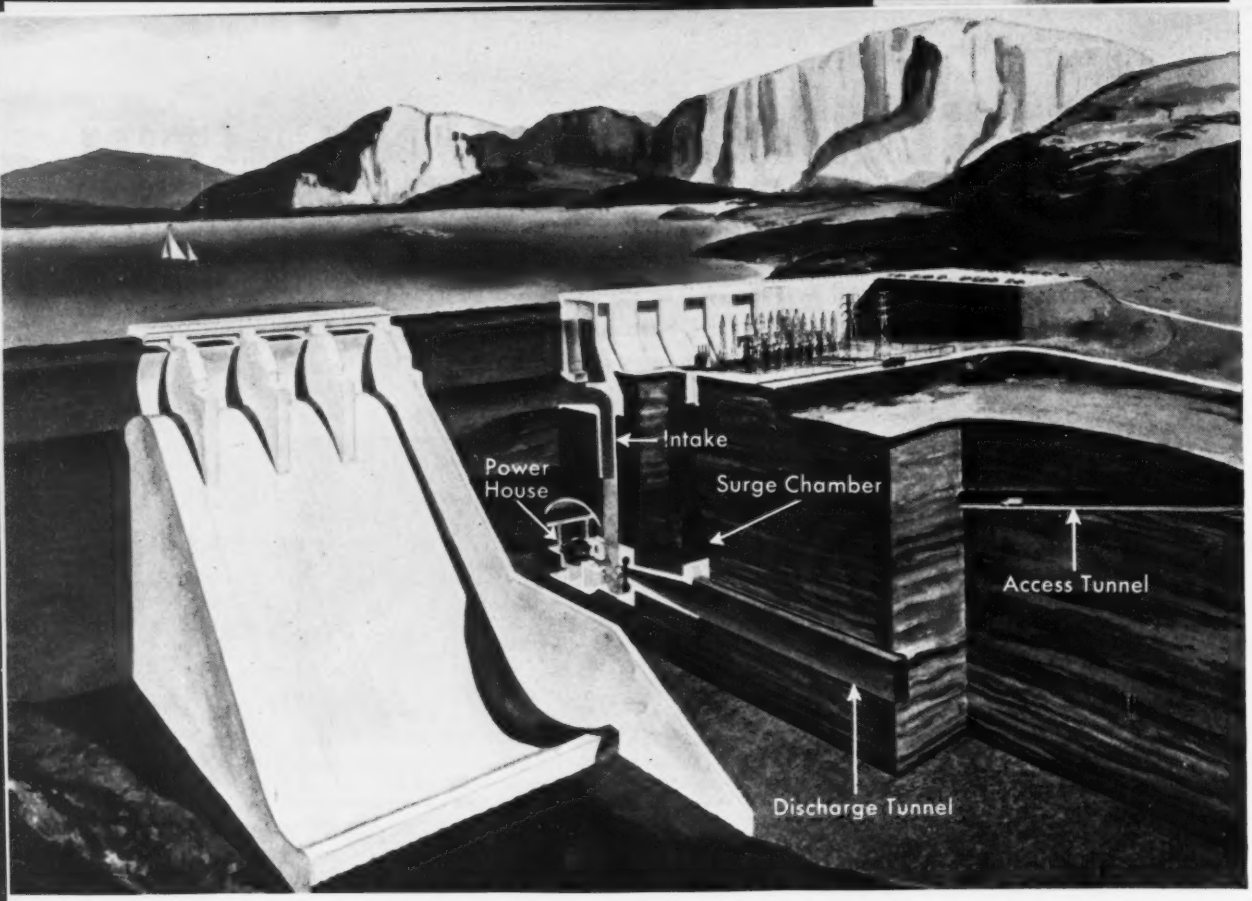
Here is a completed Bent Iron Core and coil assembly. The four air gaps of the old butt type core have been reduced to two, and the magnetic flux will always flow parallel to the grain of steel, never crossing it.



This is a recent variation of the Bent Iron Core, known as the BIE. Notice that the laps are at the top rather than at the sides. This allows for the manufacture of Bent Iron Core transformers of higher KVA rating without increasing the overall size of the transformer.

Kuhlman **ELECTRIC COMPANY, BAY CITY, MICHIGAN**
CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVES: *International Standard Electric Corporation,*
50 Church Street, 15th Floor, New York 4, New York. Cable Address: Microphone, N.Y.



LOCATION OF COMPONENTS of the Guayabo project is made clear by the sketch. Underground construction is such that 12 ft is added to the head. Surge chamber in discharge tunnel will protect against surges caused by sudden load changes under high tail water conditions

Guayabo Will Be an Outstanding Plant

Underground hydroelectric station in Salvador will have unusual design and will incorporate many advances in engineering techniques. Initial installation will be 33,334 kva

CHESTER E. BAUMAN, Chief Electrical Engineer, Harza Engineering Co, Chicago

Unusual design and advances in engineering technique will make the Guayabo Plant in Salvador one of the outstanding in the world. The 33,334-kva plant is now being built on the Rio Lempa for the Comision Ejecutive Hidroelectrica del Rio Lempa, a government agency.

Features of the plant include:

- Exceedingly deep underground construction so that a lower dam will provide the necessary head.
- A shorter penstock and a design which brings about a reduction of hydraulic losses.
- Attachment of the generator housing directly to the generator auxiliary switchgear by means of a throat connection.
- Braking on the generator instead of the turbine.
- Horizontal type turbines.

Locating the station directly below the dam and low enough to discharge tail water down stream below the rapids was a money saver. With this construction the same head can be developed as would be obtained from a higher dam downstream or from the present dam with the powerhouse below the rapids and connected to the dam by a long, high-pressure penstock. In the latter construction it is quite likely that an expensive surge chamber would have been required.

There will be a surge chamber at the Guayabo project, but it will be in the discharge tunnel. It is designed to take care of surges caused by sudden load changes under high tail water conditions.

Underground construction was facilitated at Guayabo by proper rock conditions. As the rock forms the walls and ceiling of the powerhouse, the excavation costs are offset by savings in cost of walls, roof, windows, and foundations needed for a conventional building.

The dam will be 1493 ft long and 196.8 ft high. Normal maximum head will be 177 ft. There will be a roadway across the top. Only light traffic

is anticipated. Therefore, the roadway is only a single lane with signals to limit traffic to one direction at a time.

Water from the reservoir will enter the horizontal Francis turbines tangentially, directly from above, and will discharge axially through a conical type draft tube. This design results in a shorter penstock and elminates the elbow in the penstock ahead of the scroll case. Both features reduce hydraulic losses and result in a design that is simpler to construct. Since earthquakes are not unusual in the area they were carefully considered in the design.

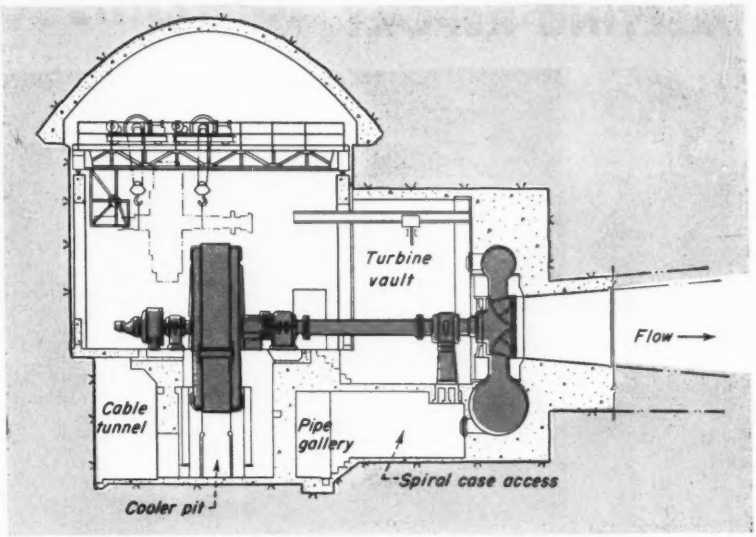
Braking Problem Solved . . . The horizontal setting of the generator introduced certain problems in design. With the Francis wheels no jet can be used in reverse direction for braking as is done with Pelton wheels. After several designs for braking had been considered, one was adopted using practically the scheme that is used for vertical wheels. A band is bolted to the spider of the generator so that two hydraulically operated cylinders with brake shoes exert pressure sidewise on the band. This movement is opposed by the thrust bearing which is required to take thrust in both directions. The bearing is pressure lubricated.

The generator housing is joined directly to the generator auxiliary switchgear by means of a throat connection. This throat carries the generator leads and all control cables leaving the generator. Included in this switchgear are excitation equipment, surge protection, current transformers, potential transformers, and neutral resistance.

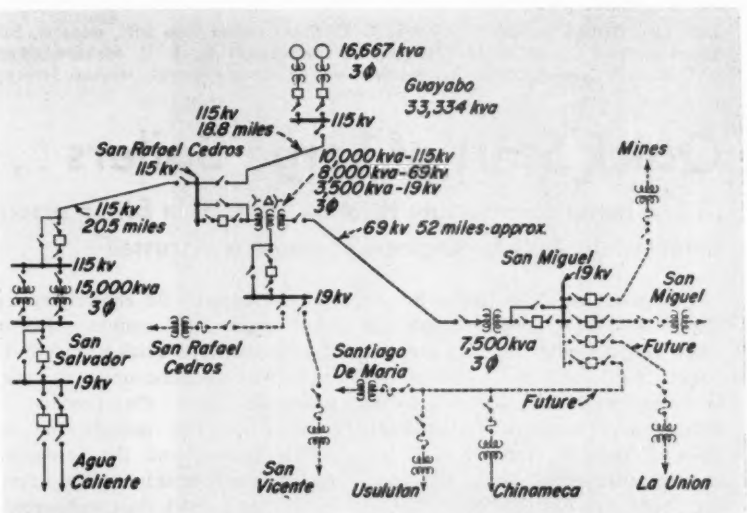
Unit Design Followed . . . Each unit is connected directly to its 13.8/115-kv transformer, and each transformer is connected through its 115-kv circuit breaker to a main bus. When the third unit is installed, a transfer bus will be added.

Ultimately there are to be five units. The powerhouse is being excavated with sufficient space for three units and an erection bay which will accommodate a fourth unit. Two 16,667-kva units are being installed. The first of these should go into operation late this year.

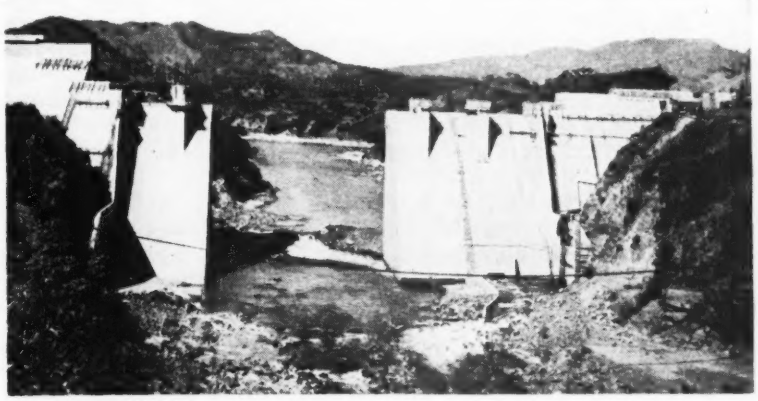
The bulk of the power will go into the Alumbrado system in San Salvador which has a capacity of only 12,000 kva at the present time.



TURBINE VAULT sectional view shows engineering details of the installation. Vault is 150 ft underground. Water used to spin horizontal Francis turbine will be discharged at right



BULK OF THE ELECTRICITY generated at Guayabo will be transmitted at 115 kv to Salvador, the capital, by way of San Rafael Cedros where a 69-kv line will be interconnected



WORK ON DAM, which will be 1,493 ft long and 196.8 ft high, is progressing rapidly. The first of the two 16,667-kva units now under construction is to go into operation in 1953

HOT LINE TOOLS are demonstrated by C. C. Coon (second from left), manager, Safety Live Line Tool Co, at MVEA conference. He is assisted by R. H. McAdams, Kansas G&E; Howard Clements, Clements Manufacturing Co; Dwight Leavitt, Missouri Service Co

Quick Start of Large Boilers . . .

. . . is better for structure than low starts, Con Edison superintendent tells MVEA. Engineer shortage is discussed

Tests made on Consolidated Edison Co of New York's system show that quick starting of large, high-pressure boilers fundamentally is better for boiler structure than slow starts. Con Edison's superintendent of production, John M. Driscoll, reported to the recent general meeting of the Engineering Conference of the Missouri Valley Electric Association, that his company's experience now includes nearly 10,000 such quick starts.

Practice was developed by installation of thermocouples at strategic points to show what was taking place and to guide the operation. Now boilers are regularly shut down for weekends, Driscoll said, when loads are light. Appreciable savings in fuel result. For the starting period alone the quick start shows a saving of 22-44% of fuel as compared with slow start. Consolidated Edison experience also indicates that quick starting is better for the turbine than slow starting, he added.

Turbine Tests . . . Success of any quick start of turbines, said E. J. Rosecky, Allis-Chalmers Manufacturing Co, depends on eliminating thermal shocks to casings. Rosecky described tests on quick starting of turbines with thermocouples at various points to guide the process. He pointed out two periods, the slow rolling period, and the accelerating period, which must be studied in order to develop a quick start technique.

Steam drums and separators will not be required in boilers designed for pressures above 3,207 psi and configuration of these higher pressure boiler units should be far different from those now in vogue, declared S. T. Mackenzie, Babcock & Wilcox Co. With 2,700 psi boilers already designed, units of considerably higher pressures are not far away, he said.

Connectors . . . Although development of connectors for aluminum distribution has lagged behind conductor development, said L. T. Guess, Aluminum Co of America, experience, demand, and competition gradually will bring improvements. Care must be used in stringing various types of conductors on the same poles, he said.

Setting tall poles to get over trees, more vigorous efforts to get adequate trimming and removal of trees and other measures to eliminate contact between lines and trees will improve service and reduce costs, S. J. Sickel, Kansas Gas & Electric Co, said.

Engineer Shortage . . . In discussing the engineers shortage, A. C. Montieth, vice president, Westinghouse Electric Corp, declared that if public utilities do not assure themselves today of the engineering leadership they will need tomorrow the result will be felt by all industry. He urged that they do something about it.

Montieth cited the following reasons for the shortage of engineers in the power industry and reluctance of young engineers to enter the field: Low salaries, stressing of security when the young engineer wants opportunity, the need for training and development programs that will catch the imagination of the young engineer.

Private utilites must not slacken their efforts to get across their story to the public, now that they appear to face a period of more favorable conditions, said Forrest P. Williams, MVEA president. Williams urged the engineers present to get out and tell the industry's story to the people, particularly, he said, because people respect the opinions of engineers.

Langlie Plans to Activate New Power Body Soon

Gov Arthur B. Langlie of Washington will activate a new state power commission "as soon as the law permits," which would be June 11.

He has returned to the state after ten days in Washington, D. C., where he told federal officials that his state now is in a position to build dams.

"If federal officials don't want to initiate projects, we are in a position to do so," Langlie said. "I think the commission also will have to consider construction of steam-generating facilities soon. The commission will play a vital and important part in the development of our total resources."

Langlie could have named a state power commission two years ago but chose not to do so when he reportedly was unable to secure the members he wanted.

L-M's EEI Specification 15" and 18" Pole Top Pins Ribbed for Extra Strength

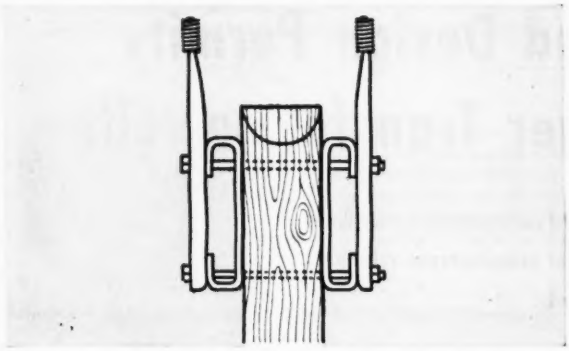
L-M's Pole Top Pins redesigned for extra strength. Ribs in the sides of channel section provide additional resistance to deflection. Meet EEI and REA specifications.

Formed ribs in the sides of the heavy channel steel of L-M pole top pins provide extra strength without adding unnecessary weight.

The pins are available in 15- and 18-inch lengths. The 15-inch pin has 5-inch hole spacing; the 18-inch pin has both 5-inch and 8-inch spacing.

Both pins amply meet the specification of 1500 pounds in transverse loading and 1200 pounds in longitudinal loading. Both are heavy 8-gauge channel steel, hot-dip galvanized.

Meet REA Specifications



The 15- and 18-inch pins meet REA specifications. Also available is L-M's REA-specification 20-inch 1⅜" lead head pole top pin and bracket.

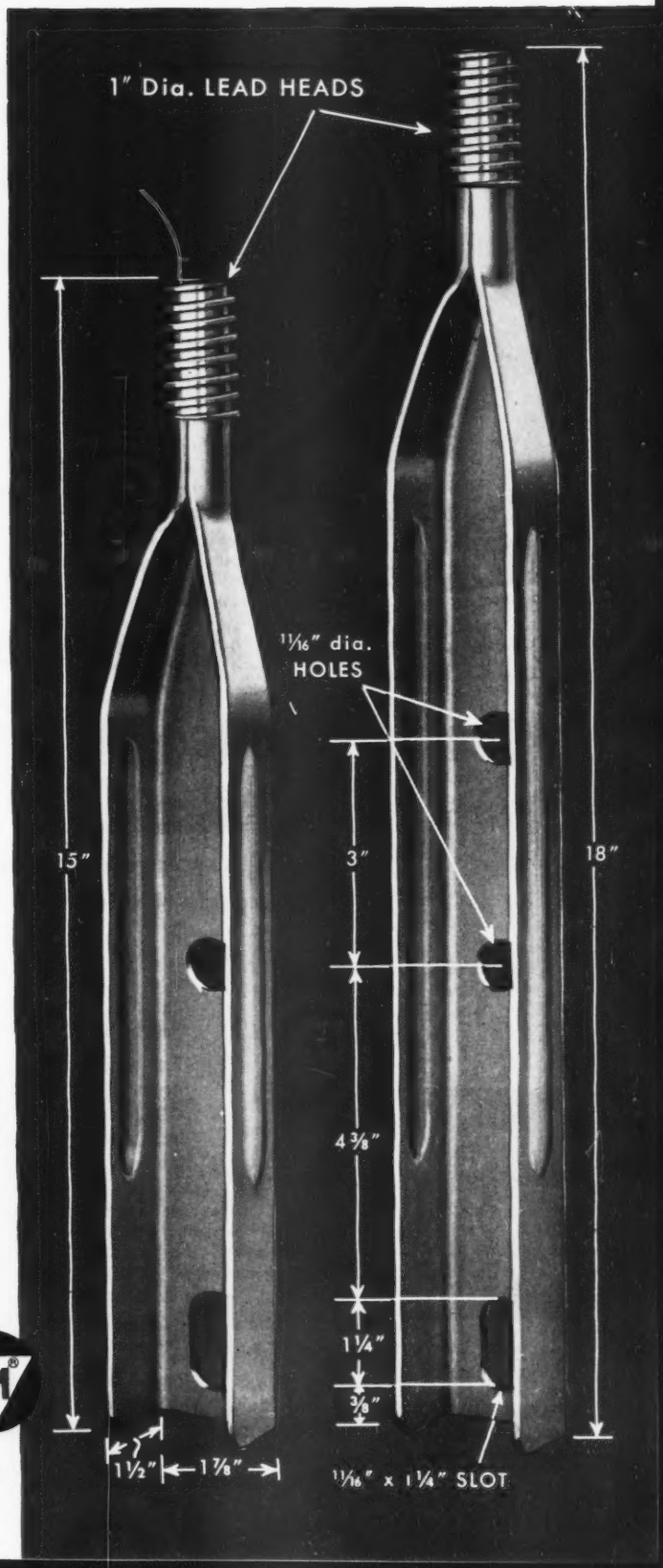
Get Information and Samples

L-M offers a wide variety of Line Construction Materials and specialties to meet almost any problem. These items are stocked in L-M's 40 warehouses all over the country. Ask the L-M Field Engineer for information and samples. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division). 115

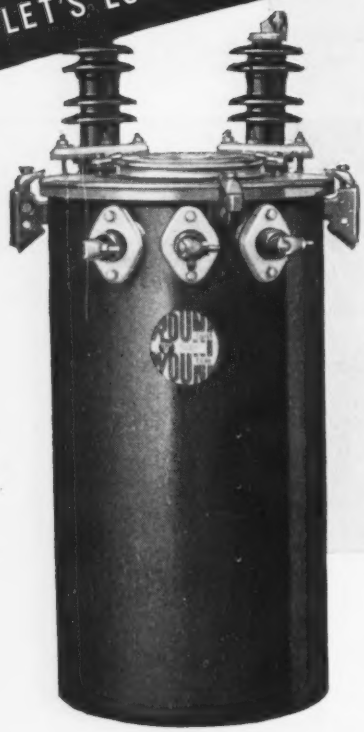
LINE MATERIAL

Line Construction Materials

BE CAREFUL. THE LIFE YOU SAVE MAY BE YOUR OWN.



LET'S LOOK AT THE FACTS



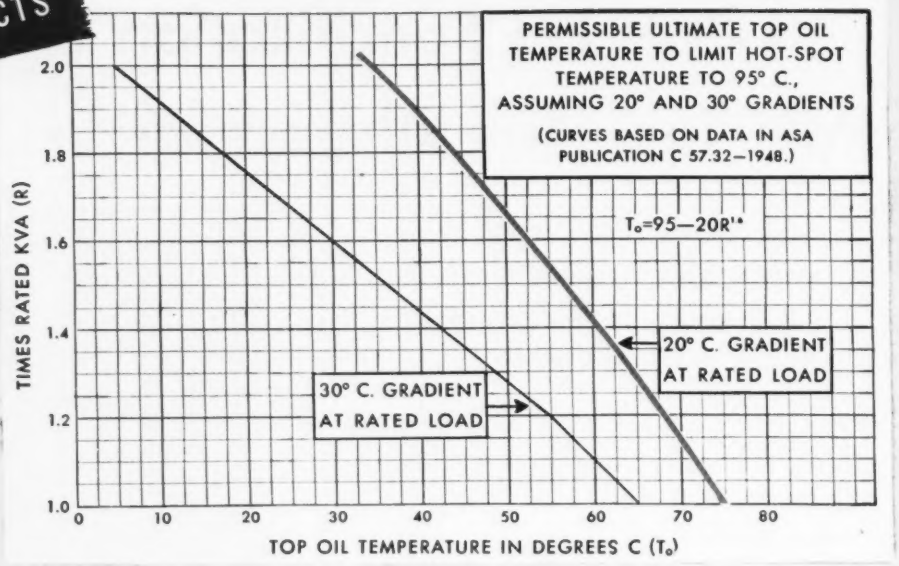


FIGURE 1—The colored line represents the conservative performance typical of a core-type transformer with highly efficient cooling such as the L-M Round-Wound, while the black curve represents the loading permissible with a transformer with less efficient cooling. These are ultimate oil temperatures. Because of efficient dissipation of heat from the coils to the oil, the oil reaches its ultimate temperature more rapidly in L-M Round-Wounds than in some other styles of construction.

How L-M Round-Wound Design Permits Heavier Loading or Longer Transformer Life

Round coils wound directly onto a wound core provide exceptional cooling that keeps copper and hot-spot temperatures relatively low even under high short-time overloads.

by **ROBERT P. THOMPSON,**
Assistant Chief Engineer,
Transformer Division,
Line Material Company

Greater transformer utilization through heavier loading offers substantial savings on almost any power system. Therefore the subject of transformer loading is receiving exceptional attention, both from utility companies and from the manufacturers.

Overload capacity of any individual transformer depends upon such factors as ambient temperatures, previous condition of loading, duration of the overload, and the sacrifice in transformer life that the user is willing to make.

But the principal factor is the transformer itself. Since overload capacity is limited by hot-spot temperature rise during the overload period, this capacity is largely determined by the design of the coils and the efficiency with which heat can be dissipated to the oil.

Obviously a core-type transformer, which has greater coil surface exposure, offers better overload capacity than shell types, in which coil surfaces are blanketed by core steel.

Round coils offer greater overload capacity than rectangular coil types, because coils present more unobstructed surface to cooling oil.

The Round-Wound transformer combines the advantages of the core-type transformer with the rapid heat dissipation of unobstructed round coil surfaces—and offers, in addition, the advantages of the cruciform-cross-section core, which provides natural oil passages for cooling the inside of the coils. Thus in the Round-Wound transformer, heat is dissipated *more rapidly* and more uniformly. For this reason the Round-Wound design provides higher short-time overload capacity, or a longer life with the same overload (Figure 3).

Get Details on L-M Round-Wound Transformers

Ask the L-M Field Engineer, or write Mr. Thompson at the Transformer Division, Line Material Company, Zanesville, Ohio (a McGraw Electric Company Division).

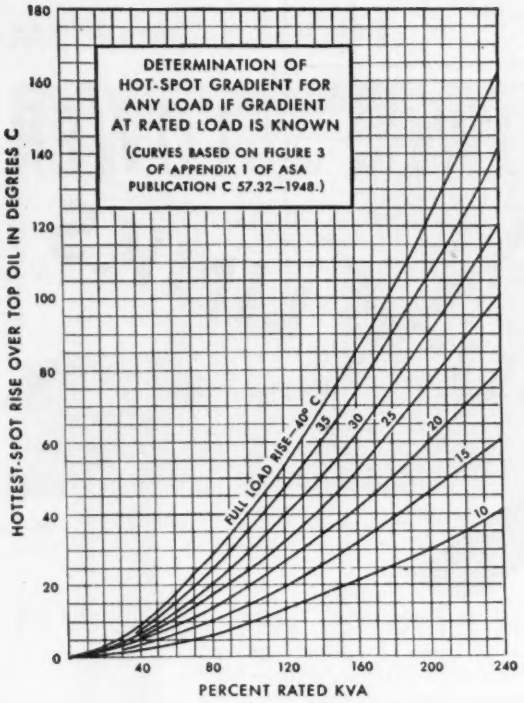


FIGURE 2—Here is presented a method of determining the hot-spot gradient for any load, if the gradient at rated load is known. It is to be noted that the higher the gradient at rated load, the more rapid is the rate of increase in the gradient with overload. The L-M Round-Wound transformer with a lower hot-spot gradient at rated load has a greater capacity for overload before damaging temperatures are reached.

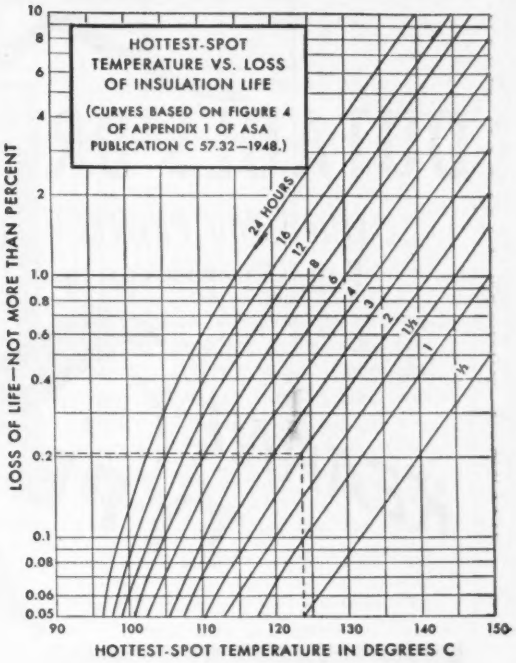


FIGURE 3—The primary factors in the deterioration of cellulosic insulation are time and temperature. Here is a method for approximating the loss of insulation life due to these two factors. Obviously an L-M Round-Wound transformer with its appreciably lower hot-spot temperatures during overloads will reduce the possible insulation damage and increase the overall life.

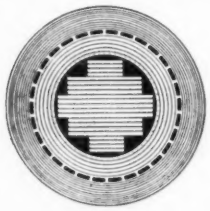


FIGURE 5—Cruciform cross section of the wound core provides oil passages between core and coils. In addition spacers between windings and between layers in larger sizes provide additional oil circulation, giving exceptionally good cooling for the entire unit.

Some of the Outstanding Characteristics of L-M Round-Wound Transformers

High Short-Time Overload Capacity

Better Regulation at all power factors

High Impulse Level, with ample creepage distances and generous insulation

High Short-Circuit Strength, because round coils have less tendency to distort

Low Exciting Current, because the core is not cut or disturbed after annealing

Better Loss Ratios with lower total losses

Filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life.

"Round-Wound" is a Line Material Co. trademark.

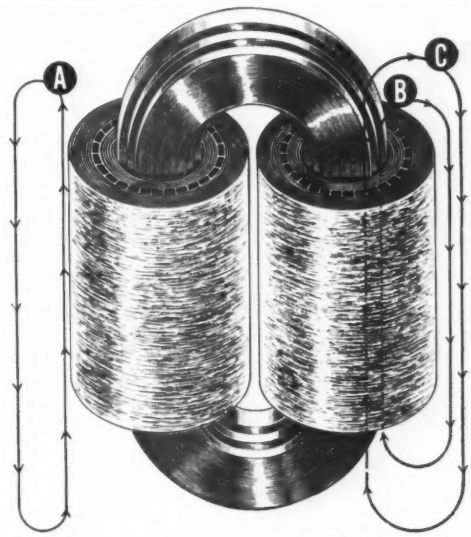


FIGURE 4—Diagrammatic presentation of the Round-Wound core-coil assembly. The core is wound of continuous strip of oriented silicon steel of various widths to give a core of cruciform cross section. Core is not unwound or cut, because coils are wound directly onto the completed, annealed core. Coils surround a maximum of the core circuit. They present a relatively large area to cooling oil.

LINE MATERIAL Transformers LM®

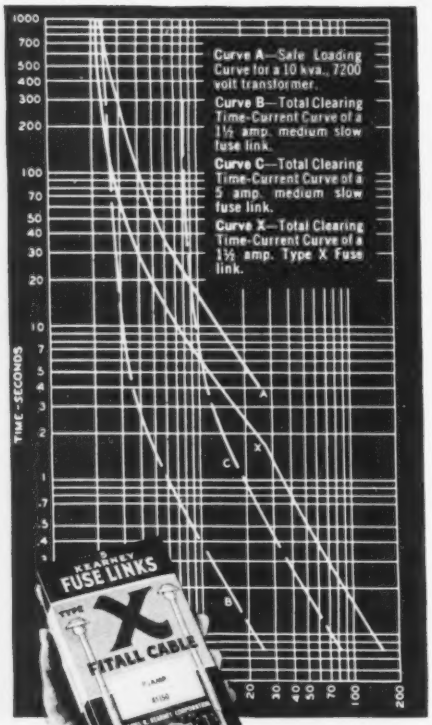
Complete Coordinated Equipment for Distribution Today

OUTAGES DROP LOWER and LOWER

when You PROTECT Your System with

KEARNEY TYPE X FUSE LINKS

Safe Overload Protection plus Extra High Surge Capacity



Kearney Pul-Tab Fuse Pak . . . Easy to store. Easy to use.

KEARNEY Type X Fuse Links have proved that they will cut *your* outages, reduce *your* troubleshooting expense, keep *your* meters turning during peak revenue periods. Designed specifically to match the safe loading curves of distribution transformers, Type X Fuse Links are saving thousands of dollars monthly for power companies all over the United States.

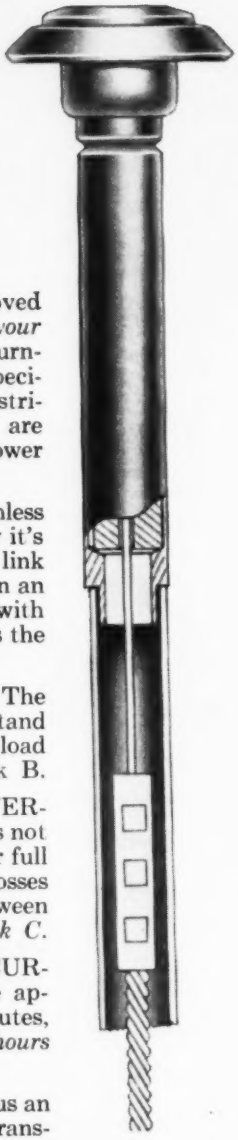
You are wasting money every time a harmless temporary overload blows a fuse. That's why it's a dollar-and-cents necessity to use a fuse link which provides service continuity yet fuses in an instant at the danger point . . . and does this with no sacrifice in surge capacity. The Type X is the answer. Here's why . . .

PROVIDES HIGH SURGE CAPACITY. The fuse curves show that the Type X will withstand a transient surge of 25 times transformer full load for *20 times longer* than medium slow link B.

OPENS HARMFUL EMERGENCY OVERLOADS. Note how curve for fuse link C does not cross loading curve until 9 times transformer full load. The Type X curve extended upward crosses at 2.2 full load thus providing protection between 220% and 900% *not obtained with fuse link C.*

MAINTAINS SERVICE DURING RECURRENT OVERLOADS. The Type X curve approaches the vertical at around 5 to 15 minutes, thus *will carry up to 175% of rating for 2 hours or longer.*

We'll be glad to send you free fuse curves plus an easy-to-use celluloid safe loading curve for transformers. Write today to Dept. FL-1.



223

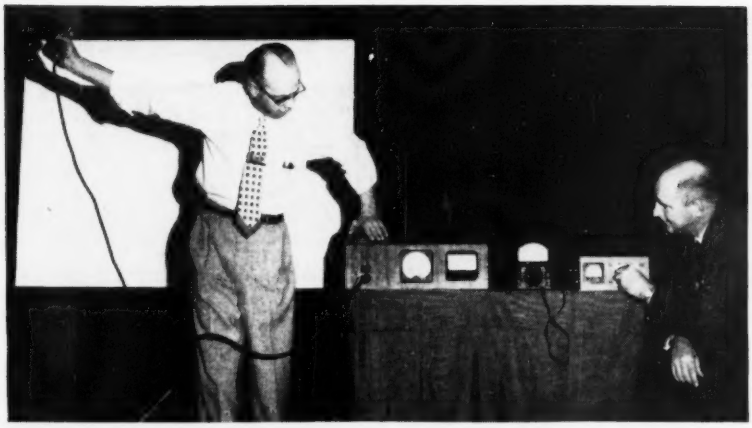
JAMES R. KEARNEY CORPORATION ST. LOUIS MO. GUELPH, ONT.

The Mark of Quality Built Products

Designed & Manufactured by

JAMES R. KEARNEY CORPORATION

4224-42 CLAYTON AVENUE, ST. LOUIS 10, MO. • *Canadian Plant:* Guelph, Ontario



LOW-VOLTAGE SHOCK hazards are demonstrated by Claude Haggard (left), safety director, California Oregon Power, before Northwest Electric Light and Power Association meeting

NW 'Power Shortage' Denied

WWP official tells Nelpa engineering meeting hydro generation is being supplemented by steam output to meet load

Present "power shortage" in the Pacific Northwest, as recently announced by Bonneville Power Administration does not exist, stated M. F. Hatch, Washington Water Power Co, Spokane. He made this point in a preliminary forecast of short and long-term loads and resources presented before the meeting of the engineering and operation section of the Northwest Electric Light and Power Association in Portland, April 8-10.

Because of reduced operating heads of water at reservoirs, Hatch said, hydro capabilities are insufficient to carry daytime loads but are being supplemented by steam power. Interruptible customers are footing the bill for this steam power. He estimated that for 1953 average hydro capability during storage season will be enough for 50-70 Mw above firm load commitments. Assuming a load growth of 5%, demand and supply will be touch-and-go through 1961-62, he warned.

Copper Supply . . . Copper supply in 1953 should be as large as in 1952, reported C. D. Dimity, Phelps Dodge Copper Products Corp, with about 200,000 additional tons becoming available in 1954. This will represent a 23% increase over 1951 supply. Looking for the defense peak to pass late this year or early in 1954, Dimity declared it is only a matter of time before copper supply will overtake demand. However, any downward price trend will be forestalled by complications which may appear among foreign copper suppliers, he said.

Aluminum, iron and magnesium are the metals of the future, said Dr E. W. Greenfield, Kaiser Aluminum & Chemical Co, Spokane. Based on estimated composition of the earth's crust, he stated there is 800 times more aluminum potentially available than copper. Aluminum production in U. S. and Canada will rise to 3 billion lb in 1954, he predicted.

New developments now undergoing tests by Kaiser include: Aluminized core wire for ACSR cable, aluminized pole line hardware, high-strength, high-conductivity aluminum alloy wire, anodized aluminum magnet wire, and better core protection for ACSR cable provided by light grease or oil for installations along sea coasts or in industrial areas.

Aluminum Cable Test . . . An all-aluminum, high-temperature cable is also undergoing tests, Greenfield reported. It consists of aluminum conductor, aluminum-oxide insulation, and a sheath of low-conductivity aluminum alloy. Kaiser presently is conducting accelerated service-condition tests on over 10,000 types of compression and bolted type connectors from 34 manufacturers to evaluate the aluminum connector problem.

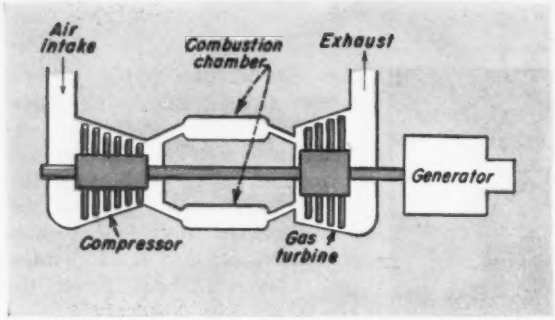
Automatizing of small capacity hydro stations through supervisory control has proven satisfactory and most economical, reported P. G. Humphreys, California-Oregon Power Co. This is based on experience with ten generators in eight plants which will total 215,000 kw when completed.

Importance of induction generators in automatic-type hydro stations was covered by J. E. Barkle, Westinghouse Electric Corp, East Pittsburgh, in discussing Portland General Electric Co's Station B. He pointed out that hydro sites which appear unattractive as synchronous-machine stations might prove economical as automatic induction-machine installations. These plants, which can be built with capacities up to 5,000-kw per machine, offer low operating costs and require simple, inexpensive protection and control schemes, he said.

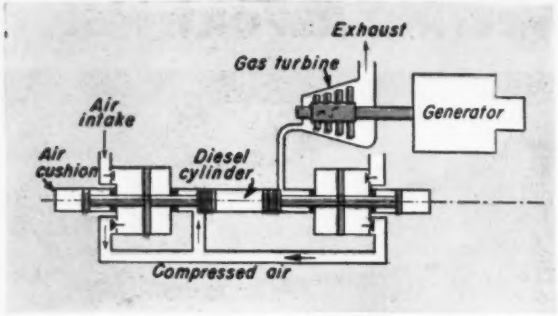
Microwave Systems . . . In seven months of experience with microwave system between Pacific Power & Light Co's Yale and Merwin Dams only six tubes have been replaced, L. A. Carter reported. Of these, three were type 12-AT7. System reliability has been 98.7%, with causes of total 1.3% outage time distributed in this manner—power failure, 17%; tube failure, 50%; component failure, 33%.

Carter disclosed the following data on operations of BPA's extensive microwave system: Total outage time in 1952 was about 0.4%. Over a 26-month period to Jan. 1, 1953, causes of outages were—weather, 0.0%; components other than tubes, 37.2%; tubes, 34.3%; station power failure, 1.8%; maintenance, 4.9%; miscellaneous, 21.8%.

During a discussion of TCUL equipment, C. J. Scoville, Portland General Electric Co, told of gaining 3-5 times life of original oil by reclaiming and adding inhibitor. He mentioned that binding of TCUL equipment on full boost or buck may be due not to tap-changing equipment but to control circuit conditions, such as loose connections in potential circuit, poor contacts in contact-making voltmeter, or over-rated synchronous motor used to actuate contacts.



CONVENTIONAL GAS TURBINE is powered by expanding gas from combustion chambers. Most of its output drives the air compressor which feeds combustion chamber; remainder powers electric generator



FREE-PISTON ENGINE replaces rotary compressor and combustion chambers. Oil or fuel gas are burned in diesel-like cylinder. Pistons drive air compressor to scavage combustion products into turbine

Free-Piston Engine Combustion Doubles Gas Turbine Efficiency

Self-powered unit, being introduced by Cooper-Bessemer Corp, burns oil or gas with economy comparable to diesels

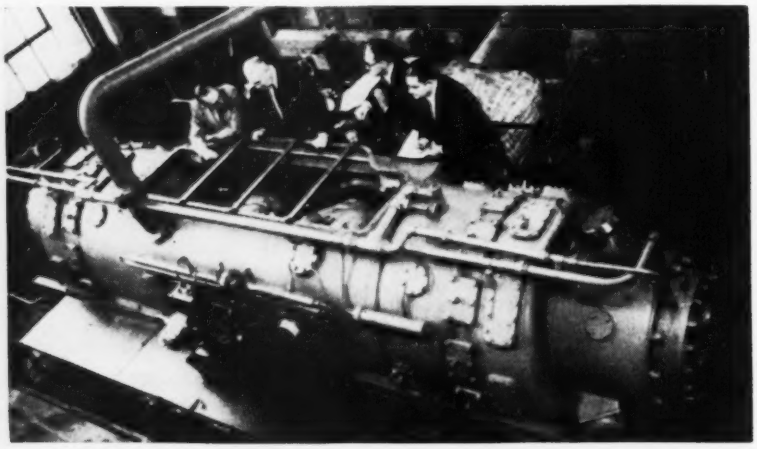
Twice the present fuel efficiency of gas turbines at a savings of 25% in installed cost is claimed by Cooper-Bessemer Corp for its free-piston engine. This engine takes the place of the conventional rotary compressor and combustion chambers, delivers compressed hot gas directly to the gas turbine. This development will be presented to the industry and a scale model shown at the Tulsa Oil Show on May 14.

Because none of the gas turbine output is used to compress combustion air, the turbine need only be large enough to power the electric generator. In some cases a turbine ¼ the size of the conventional gas turbine will suffice. Operating on either gas or liquid fuel with fuel economy comparable with the finest diesels, the free-piston engine and gas turbine are now expected to find extensive use in the electric generating field, especially for stations up to 25,000 kw.

The free-piston engine is basically an ordinary internal combustion engine without connecting rods or crankshafts. Two identical pistons move in opposite directions in a common cylinder. Fuel ignited in the cylinder drives the pistons apart. The motion drives larger pistons in two direct-coupled air compressors to force air into a reservoir. As the propelling pistons reach the outer end of the propulsion stroke, air from the reservoir rushes into the cylinder to scavage and cool the hot combustion gases.

Trapped air in a third pair of cylinders attached outboard of the compressors returns the pistons to the firing position, forcing the combustion

DEMONSTRATION MODEL of free-piston engine is explained to President Lefebvre by Consultant Ramsey of Cooper-Bessemer Corp



TEST INSTALLATION of free-piston engine at Mt. Vernon, Ohio, laboratory has operated for 18 months. It furnishes combustion products to power a 1,500-hp gas turbine hidden in background. Tests prove its ability to double the fuel economy of a conventional gas turbine

gases and heated air through an exhaust passage to the gas turbine.

Like the similar diesel engine, the free-piston engine gains efficiency by burning fuel at temperatures up to 4,000 F. But the reciprocating motion of the pistons and cycling of air through the cylinder hold the temperature of discharged gases to 1,000 F. Thus the gas turbine which it supplies can be manufactured from readily available and easily formed materials similar to those used in steam turbines instead of special high temperature alloys.

These results have been established from 18 months of load testing a 1,500-hp unit in the Cooper-Bessemer laboratory at Mt Vernon, Ohio. Design of this machine was begun shortly after it was revealed that free piston engines had been used in German submarines. Generating efficiencies as high as 40% have been achieved. And the efficiency remains high regardless of load variations, unlike the conventional gas turbine which loses efficiency at reduced load.

Further efficiency gains are available by supercharging the free piston engine. But the conventional gas turbine must have costly regenerators, intercoolers, reheaters, and higher temperature materials. Eliminating these complications is estimated to make the free-piston engine combination 25% less costly, in addition to its marked advantage in fuel economy.

Being self-propelled, the new engine can be used for a range of turbine sizes. A number of engines can be grouped to feed a large turbine, and the number in operation can be varied to match load requirements. And use of a water jacket for cooling, similar to that of internal combustion engines, permits operation with a closed water system.

PG&E Gets Extension

Pacific Gas & Electric Co has been granted 30 days longer to inform the Bureau of Reclamation whether or not it will wheel Central Valley Project power over its lines to the Sacramento Municipal Utility District, which signed a power agreement with the bureau in December. Under the terms of PG&E's 1951 wheeling contract with the government, its answer to the bureau's Jan. 3 request would have been due within 90 days had it not asked for the extension, also provided for in the contract.

Fleet Parley

Coordination between manager and manufacturers of aerial equipment and chassis discussed at EEI meeting

Better coordination between manufacturers of aerial equipment, manufacturers of truck chassis, and the fleet manager is needed. This was the theme of the symposium on the selection of aerial apparatus and related chassis conducted by Edison Electric Institute's Transportation Committee in Chicago on April 13.

D. K. Wilson, chairman of the committee and transportation manager of Niagara Mohawk Power Co, keynoted the discussion by noting: "The high degree of flexibility and productivity of aerial equipment has made its use attractive to utility operating executives. To produce a satisfactory unit the transportation manager must skillfully integrate the products of the chassis manufacturer, the body builder, and the producer of aerial apparatus. The widest possible interchange of information is essential to proper specification."

He added that this was particularly true of new types of apparatus, and more particularly true of aerial equipment, where safety of life and limb depends on care and skill in design and specification.

Chassis Design . . . H. P. Strother, White Motor Co, declared that the assignment of a truck chassis as a movable support pedestal for overhead equipment differed little from other requirements of chassis except for springs and frames.

Compromise in spring design is the only solution to the problem of providing a smooth ride and maintaining stability when the center of gravity is raised for overhead work unless jacks are used, he said. Strother added that his company believed the use of jacks should be mandatory.

Most critical items on the chassis are the rear springs, according to Roy Balogh, McCabe-Powers Auto Body Co. The load exerted on the springs should be within the rating set by the chassis manufacturer. Under these conditions the spring deflection will be kept in range and the body deflection should be reasonable. Special springs of a higher rate than those supplied with the chassis, Balogh declared, can be used when calculations indicate that the standard springs will be overloaded.

G. H. Eckels, J. H. Holan Corp, noted that a truck with light springing may allow the chassis to rock excessively, while the tower is being used. At ground level, he said, the spring deflection may not seem too serious; however, to the occupants of the tower platform 20 or 30 ft high, the feeling may be alarming or even frightening. This unnecessary swaying, he asserted, can be remedied by the use of support jacks.

O. B. Maxwell, Maxwell Equipment Co, enumerated the features to be considered in choosing a unit—working sphere, vehicle space utilization, work platform design, insulation, flexibility, accessibility, and roadability.

"In almost every case it is desirable that the unit be so located and so designed that a minimum of body space is utilized in order that the truck may be equipped with suitable bodies for line or construction work, maintenance, street light washing, etc," Maxwell declared.

AEC Not Expected to Block 2 Dams at Priest Rapids

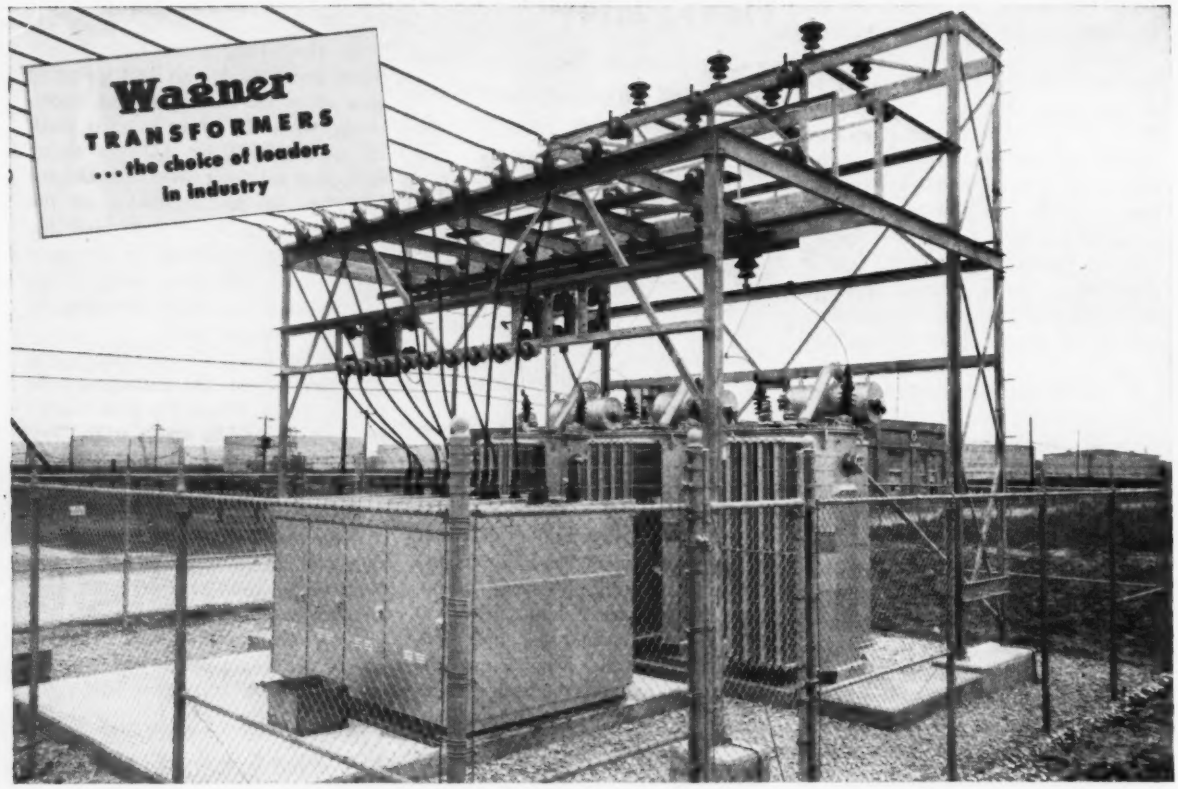
The Atomic Energy Commission probably would not oppose the plans of the Grant County PUD to build two low dams across the Columbia River at Priest Rapids not far from the commission's Hanford Works at Richland, Wash., says David F. Shaw, works manager.

AEC earlier had expressed concern over plans for a high dam at the rapids, fearing that destruction of the dam in an atomic attack would wipe out the works. As a result, the PUD has revised its proposal to call for two dams about 15 miles apart.

Glenn Smothers, manager of the PUD, now is asking Congress to revoke authorization given the Corps of Engineers for a multiplepurpose dam at Priest Rapids. He estimates cost of the PUD dams at $358 million, compared to $412 million for a single high dam, with completion in about four years as compared to the seven required for a high dam.

Power output would be about the same under either plan, Smothers believes, around 1 million kw.

The cities of Seattle and Tacoma are reported to be interested in the Priest Rapids project, in cooperation with the PUD.



to keep the wheels of progress turning

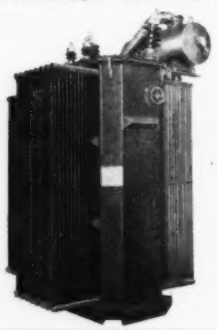
The wheels of progress literally depend on petroleum products to keep them turning. Petroleum products, like those of The Texas Company, provide fuel for motive power, lubricants to help overcome friction, coolants to speed production — as a few examples. A steady flow of these vital products from the refinery depends, in turn, on a steady flow of electricity—the power for production.

Wagner Transformers, like this bank of 2000 kva power transformers at the Port Arthur plant of The Texas Company, steadily feed electric power at the right voltage for use in this plant.

Wherever electric power is used, in industry, commerce, city and farm — Wagner Transformers can be found, handling their never-ending job of supplying proper voltages for every purpose with complete dependability.

Wagner engineers are qualified to specify the correct transformer for *your* requirements. Consult the nearest of our 32 branch offices, or write us.

Wagner Electric Corporation
6456 PLYMOUTH AVE., ST. LOUIS 14, MO.



Wagner Electric Corporation EST. 1891

ELECTRIC MOTORS • TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

WT52-11

NEWS ABOUT PEOPLE

ROBERT M. MILLER

WILLIAM C. PORTER, JR

Miller, Porter Elected VPs . . .

. . . of Southern Colorado Power. They formerly served as secretary-treasurer and vice president's assistant, respectively

Two new vice presidents have been appointed by Southern Colorado Power Co with headquarters at Pueblo, Colo. The newly elected officials are Robert M. Miller, secretary-treasurer, and William C. Porter, Jr, assistant to the vice president in charge of operations.

Miller will serve as vice president and treasurer. Porter succeeds the late M. G. Lord, who had retired as vice president in charge of operations. Lord, 75, died Wednesday, April 15, at Pueblo, Colo., fourteen days after his retirement became effective.

Miller started with Southern Colorado Power in 1920 as cashier of its Canon City office. Prior to becoming secretary-treasurer, he served as assistant treasurer, assuming the post in 1925.

Started in Line Dept. . . . Porter began with the utility in 1926 as an engineer in the line department. In May 1940 he was made field engineer for construction of the company's plant addition completed in 1941. He was appointed an engineer in the office of the vice president in charge of operations in November 1940 and was promoted in 1947 to assistant to the vice president in charge of operations.

Lord in 1907 entered the service of Pueblo & Suburban Traction & Lighting Co, later merged with Southern Colorado Power. At that time, he was placed in charge of the electrical repair department. He was advanced successively to chief electrician, assistant superintendent, and superintendent of power plants and shops in 1919. He became vice president in charge of operations in 1931 and was made a director in 1937.

Operating Dept. Changes Made by Central Hudson

Central Hudson Gas & Electric Corp, Poughkeepsie, N. Y., has announced that Robert B. MacGuinness has terminated his assignment as vice president in charge of operations to devote his full time to directing completion of the utility's Danskammer Point Steam Station Unit No. 2.

MacGuinness, who has filled the operations post since 1939, will continue as a vice president and also will handle any special assignments as directed by Pres Ernest R. Acker.

Direction of the operating department's activities has been taken over by John O. Fuchs, general operating manager; George H. Landis, chief engineer; and C. Imbrie Richards, purchasing agent. All three have been made members of the company's board of managers and will report directly to the president.

These three men have also been named members of a committee to co-ordinate the activities of the operating department. The committee will include the following associate members: G. Harold Underhill, deputy chief engineer; Ernest E. Althouse, assistant general operating manager and electric operating manager; G. Edward Hitz, gas operating manager; Thomas A. Corby, superintendent of buildings and transportation; and George J. Ruoff, safety director.

•

F. M. Sloan, formerly operations manager of Westinghouse Electric Corp's Television-Radio Division, has been named manager of the company's Lamp Division with headquarters at Bloomfield, N. J. Sloan succeeds **Ralph Stuart,** who has been in charge of that division since 1943. Stuart, who asked to be relieved of the operating responsibilities for personal reasons, will remain with Westinghouse in a consulting capacity.

S. C. Johnson, vice president of Dearborn Chemical Co, has been elected a member of the Dearborn board of directors.

CECIL L. CLARK

Sangamo Electric Elects Clark Vice President

Cecil L. Clark has been elected vice president and secretary-treasurer of Sangamo Electric Co, Springfield, Ill.

Associated with Sangamo Electric since 1935, Clark was named comptroller of the company in 1942 and was appointed to the office of secretary-treasurer in 1945, in which capacity he has served up to the present time.

Fife Named Chief Engineer . . .

. . . of West Penn Power. Drake, Hurd, MacDonald, and Soisson are made assistant vice presidents. Divisions merger planned

J. E. FIFE

J. E. Fife, manager of power supply for West Penn Power Co, has been appointed chief engineer of the utility.

West Penn Power has also named four men to newly created positions of assistant vice presidents. They are: W. V. Drake, R. W. Hurd, R. G. MacDonald, and J. V. Soisson.

In Charge of System Planning . . . Fife, who served as division manager at both Ridgway and Kittanning before joining the headquarters staff at Pittsburgh in 1949, will be responsible for the company's system planning, electrical engineering, communications, and civil engineering.

Drake, who has been manager of power production, continues his present responsibility for West Penn's power generation with the related function of system operation coming under his supervision.

Before being appointed assistant to the president last year, Hurd was West Penn's division manager at Washington and Kittanning. Hurd now will be responsible for the administration of West Penn's six operating divisions.

MacDonald will supervise transmission and distribution lines and substations throughout the territory served by West Penn. Prior to his appointment last year as assistant to the vice president, he was division manager of Ridgway.

Soisson, Central Division manager at Charleroi, will move to Pittsburgh as assistant vice president on the president's immediate staff.

Other staff changes include the promotion of D. T. Faust from Western Division manager at Washington to Central Division manager at Charleroi. E. D. Miller, Eastern Division manager at Greensburg, replaces Faust at Washington.

To Merge Divisions . . . West Penn has also announced plans to merge its Eastern and Southern Divisions Nov. 1. W. E. Sturm, commercial manager, Pittsburgh, is promoted to manager of the Eastern Division at Greensburg, and will become manager of the combined division, which will be known as Eastern Division with eventual headquarters at Connellsville.

S. S. BRADFORD

Potomac Edison Elevates Bradford to a New Post

S. S. Bradford, promotional manager of Potomac Edison Co, has been advanced to general commercial manager. His successor as promotional manager is C. D. Lyon, who has been the company's advertising and publicity manager for the past several years.

In other promotions made by Potomac Edison, Charles Morrison was elevated from relay engineer to the newly created post of planning engineer for the utility's operating department.

A graduate of Virginia Military Institute, Bradford started with Potomac Edison in 1934. He has been active in committee work with the Edison Electric Institute and Southeastern Electric Exchange.

Prior to joining Potomac Edison in 1932, Lyon was associated with the advertising department of West Penn Power Co. Lyon is third vice president of the Public Utilities Advertising Association.

Except for a four-year period of service as a lieutenant commander in the Navy during World War II, Morrison has spent his entire 29-year utility career with Potomac Edison. In addition to his membership with the American Institute of Electrical Engineers, Morrison is also a member of the system planning committee of Pennsylvania Electric Association.

Leslie, Malone Advanced

Orren S. Leslie has been elected vice president in charge of manufacturing for Fairbanks, Morse & Co, Chicago. The company also appointed G. J. Malone as vice president-comptroller and elected J. A. Cuneo, general sales manager, to the board of directors. Leslie, who joined the company in 1951 as works manager of the Beloit (Wis.) plant, has served as manager of manufacturing for the past year. Malone, who has been with the Chicago firm for many years, formerly was comptroller. With the Fairbanks-Morse organization since 1929, Cuneo for the past two years has been general sales manager.

•

James F. McClelland, Jr, standards engineer of Rockbestos Products Corp, New Haven, Conn., has been appointed engineering manager for the firm. McClelland came to Rockbestos as an engineer from Chrysler Corp.

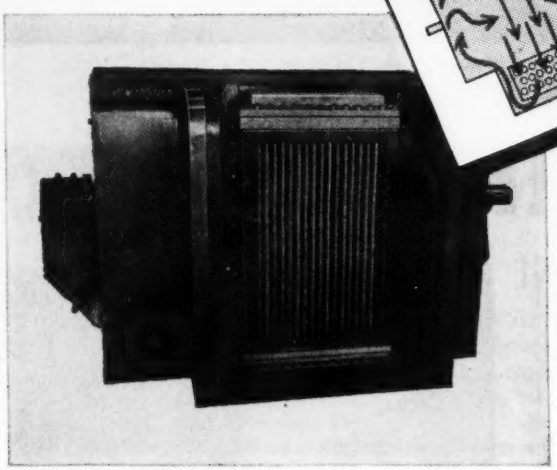
George M. Graetz has been appointed manager of the new Eastern plant of A. O. Smith Corp's Welding Products Division, now under construction at Lancaster, Pa. Graetz recently has been acting as project manager in the development of the new plant.

OBITUARY

Alexander B. Gilfillan, 76, associated with Philadelphia Electric Co for 40 years before his retirement, died April 15. He was director of retail sales in the Philadelphia area when he retired five years ago.

IT'S COOL — IT'S QUIET!

The ELLIOTT TOTALLY ENCLOSED WATER COOLED MOTOR



The Elliott TEWC motor, with cover removed from the heat exchanger unit. These cool, water tubes take the heat from the fan-driven air which circulates around them and back to the motor. (Note plan view above.) This motor drives a boiler-feed pump.

Here is a fine example of the adaptability of Elliott Fabri-Steel construction to the requirements of individual motor design. Note the simple, clean lines of this 2000-hp two-pole induction motor, ideally fitted for operation where dirty atmosphere required totally-enclosed design, and surroundings demanded the quiet of totally-enclosed water cooling.

With Fabri-Steel construction Elliott engineers found no difficulty in placing the heat exchanger tube bank just where it should be for most efficient cooling, at the same time achieving pleasing lines in outward design.

For full details on this and other Elliott large motors, contact your local Elliott engineer or write Elliott Co., Ridgway, Pa.

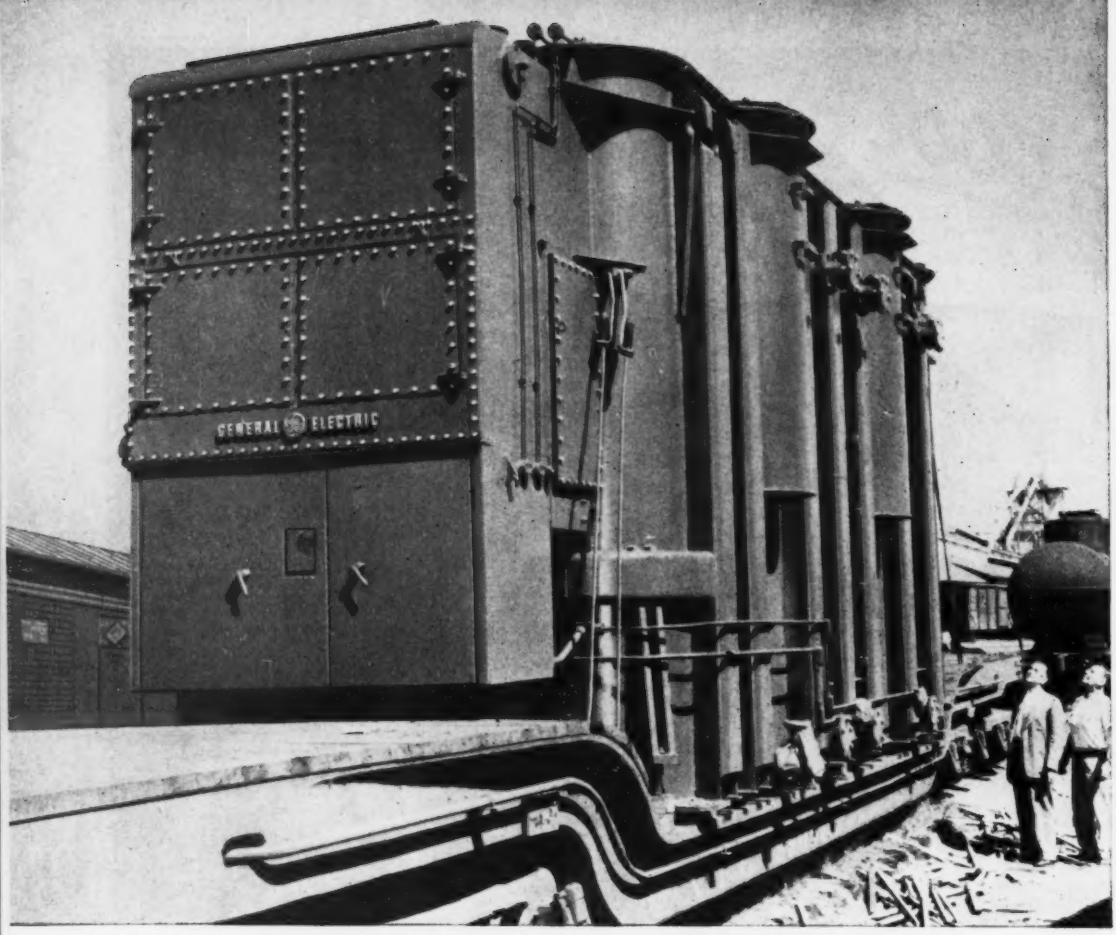
Elliott FABRI-STEEL MOTORS AND GENERATORS

ELLIOTT Company

RIDGWAY DIVISION

R3-17

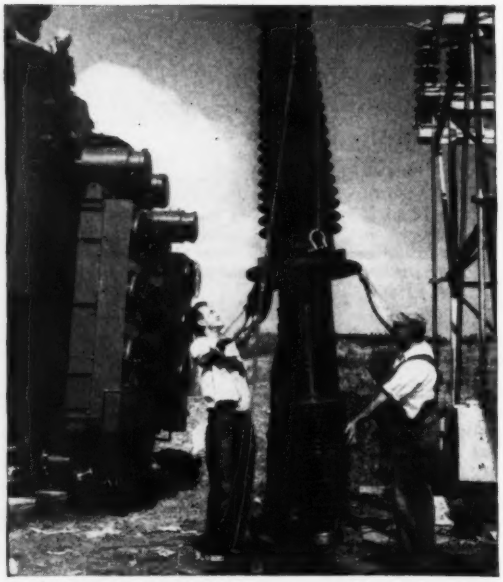
FOR MOTORS 1-200 HP. CROCKER WHEELER DIV. AMPERE, N. J.



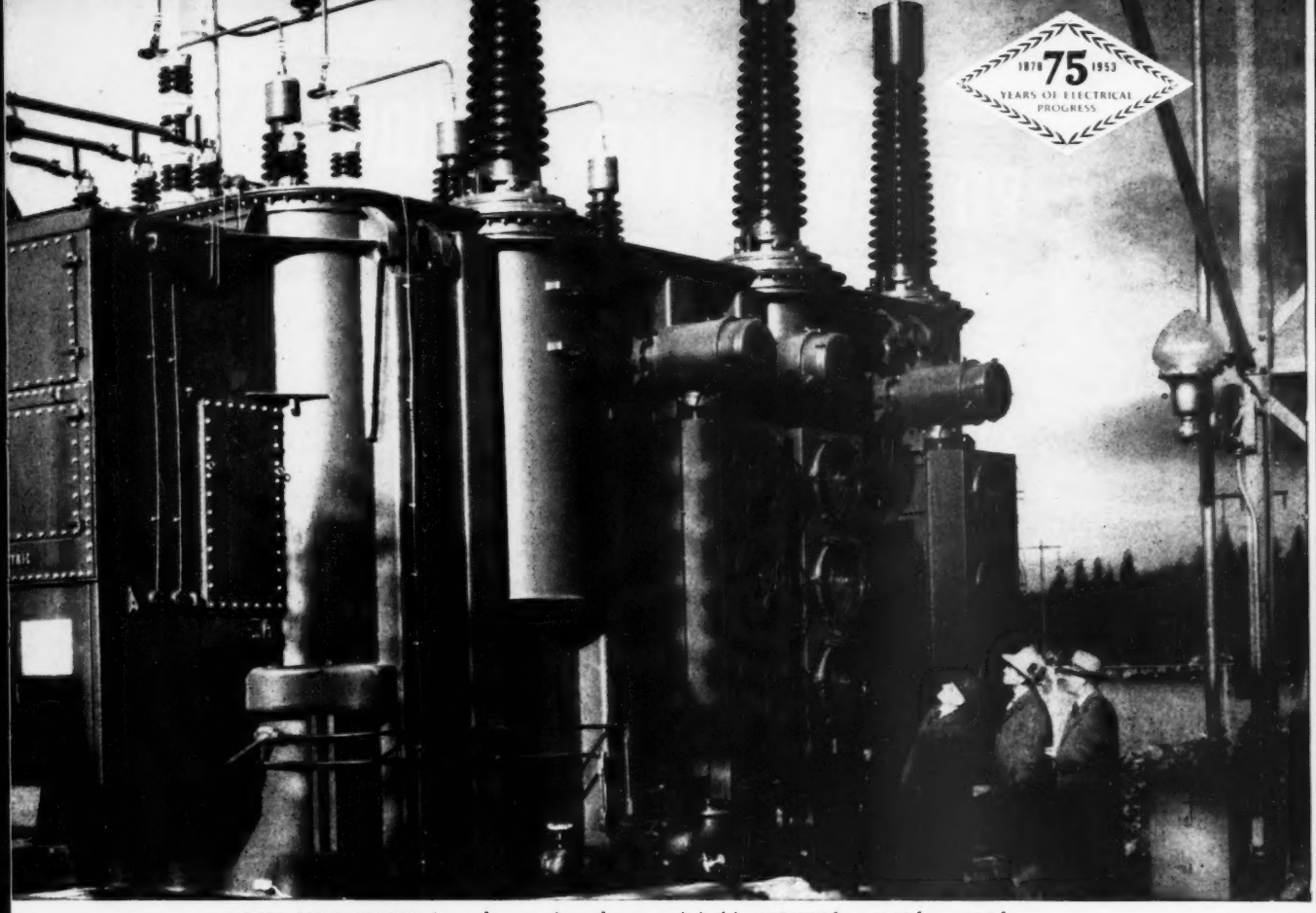
Upright shipment in one-piece tank means you can . . .

INSTALL G-E "CONCENTRIC LAYER"

TRUCK SERVES AS WINCH to transfer the unit from railroad car to trailer for the 2-mile trip to the foundation. Large cranes were eliminated, thus saving time and money.



BUSHINGS WERE INSTALLED just two days after unit was placed on foundation. One-piece tank construction contributed to speed of installation.



8 DAYS AFTER DELIVERY (one day was lost due to rain) this 125,000-kva, 220-kv—115-kv—13.2-kv autotransformer was ready to energize. Unit is cooled by directed flow of forced oil.

TRANSFORMERS FASTER . . . AT LESS COST

Washington Water Power energizes 125,000-kva G-E unit 8 days after delivery

Recently installed at the Beacon Substation of the Washington Water Power Company of Spokane, Washington, this General Electric autotransformer joins a 220-kv line, from the company's new Cabinet Gorge generating station, to an existing 115-kv system. This transformer, one of the largest autotransformers ever installed in the Pacific Northwest, is equipped with plus and minus 5% load-ratio-control. A second identical unit is now being installed and the two units will carry the entire output of Cabinet Gorge.

Reduced weight and dimensions resulting from the use of G-E "concentric layer" high-voltage windings permitted the autotransformer and the load-ratio-control series transformer to be fitted into a one-piece tank and shipped in an upright position.

In addition to their inherent compactness, "concentric layer" windings provide:

- High impulse strength due to uniform distribution of impulse voltages and the elimination of harmful oscillations.
- Effective inter-layer cooling—vertical ducts between layers permit unrestricted oil flow past each conductor.
- Greater mechanical strength because major magnetic forces are radial and well within the tensile strength of the conductor.

If you contemplate systems 161 kv or above in high-capacity ratings, it will pay you to review the data on "concentric layer" transformer design. Ask your G-E Apparatus Sales Representative for Bulletin GER-129, or write to Section 421-1, General Electric Company, Schenectady 5, New York.

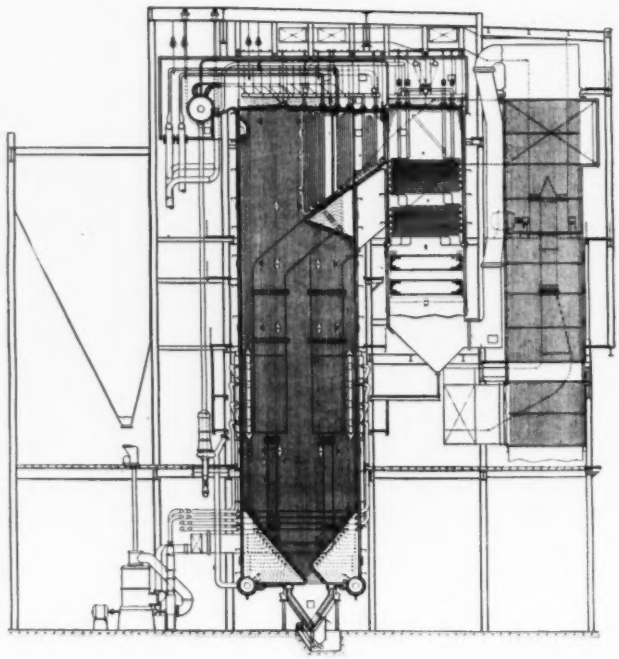
You can put your confidence in—

GENERAL ELECTRIC

POTOMAC RIVER STATION

Potomac Electric Power Company

C-E controlled circulation boilers



The C-E Unit shown above is one of two duplicates now in process of fabrication for the Potomac River Station, Alexandria, Virginia, of the Potomac Electric Power Company.

Each of these units is designed to serve a 100,000 kw turbine-generator operating at a throttle pressure of 1800 psi with a primary steam temperature of 1050 F, reheated to 1000 F.

These units are of the controlled-circulation, radiant type with a reheater section located between the primary and secondary superheater surfaces. An economizer section follows the rear superheater section and a tubular type air heater follows the economizer surface.

Pulverized coal firing is employed, using bowl mills and tilting, tangential burners.

B-670

C-E

COMBUSTION ENGINEERING–SUPERHEATER, INC.

200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS

Infrared Surface Cooking Unit Now Being Marketed

Announcement by Sylvania of an infrared surface cooking unit then in development caused quite a stir a couple of years ago. The unit is now being marketed as a component of an electric range sold by Sears Roebuck. The range is manufactured by the Newark Stove Co, Newark, Ohio, a Sears subsidiary. Sylvania states that all the present production of the lamp is being taken by Sears, but hopes that output can soon be increased to make the bulb available to other range manufacturers and for industrial uses.

The lamp is rated at 1550 watts, has a gold-plated reflector and is covered by a plate of red "Vycor" glass developed by Corning Glass Works. Both the bulb and the cover plate are stated to withstand temperatures up to approximately 2700 deg F. In tests, lead was melted on the plate and ice water poured over it without doing any damage. As now marketed, the lamp is guaranteed for one year. Life tests indicate that it will give service for many years in household use. The new unit is claimed to reach cooking temperature faster than any other. Its replacement cost is about the same as for a conventional unit.

INFRARED UNIT being assembled for installation in electric range

A feature of the unit is that its operation is visible. The red glow varies with temperature and turning the heat up or down is readily seen. Another feature claimed is increased cleanliness, the cover plate easily wiped off.

Pelco and Dealers Set Up 1953 Sales Campaign

The Patchogue Electric Light Co., a non-merchandising utility, in cooperation with appliance dealers and distributors has set up a promotional campaign for 1953 which will cover all major appliances.

Calendar for the dealer sales campaign is:

January, February and March—Laundry Equipment especially dryers.

March, April and May—Ranges and Water Heaters.

June, July and August—Refrigerators and Freezers.

September and October—Laundry Equipment.

September, October, November and December—The Big Four: Dishwashers, Ranges, Water Heaters and Freezers.

November and December—Electrical Gifts for Christmas.

Central theme for each campaign will be, "Electrical Living for Better Living." Over 14,000 customers will be reached with this message.

The utility's goal is to add the following major appliances to their lines:

Ranges	700
Water Heaters	400
Refrigerators	700
Freezers	300
Washers	600
Dryers	100

Newspapers, radio, direct mail plus demonstration at the utility showroom will be the basis of each campaign. During each campaign a special newspaperlike mailing will go to 12,000 to 14,000 customers. This mailing will be tied in with the campaign and offer various prizes and awards as well as interesting editorial material for the housewife.

Housewares Gift Drive to Double Its Dealers

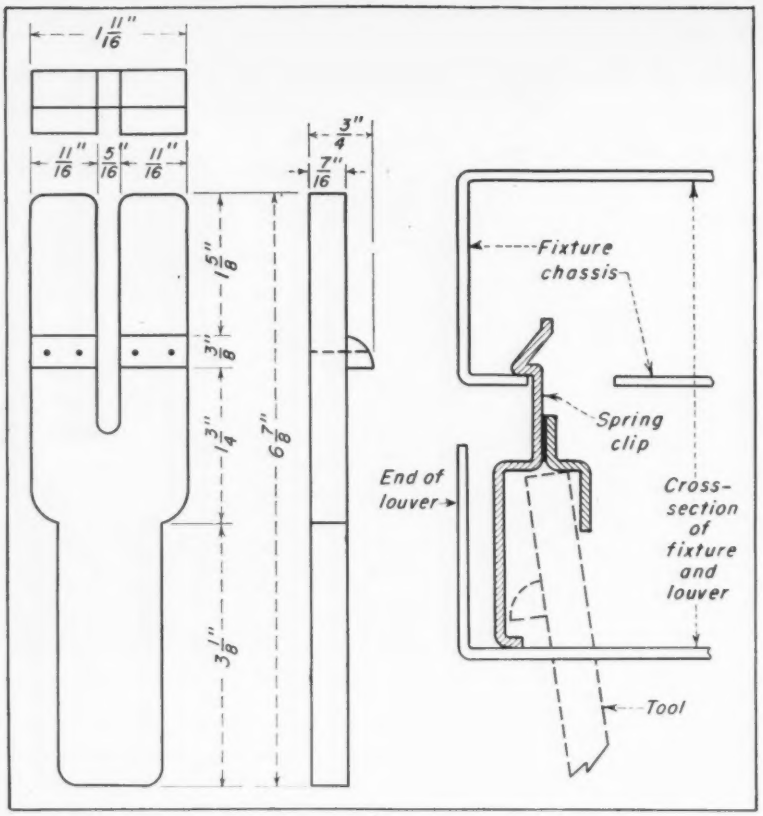
Participation of 50,000 dealers, almost 50% more than in 1952, is expected for the 1953 Electric Housewares Gift Campaign, it was announced at a meeting last month of the National Electrical Manufacturers Association.

The 1953 program will carry on many time-tested techniques as well as several newly-developed ideas for increasing sale of housewares items. New campaign emblem, with its logo "First Gift Choice—Electric Housewares," will appear in dealers' windows, and in advertising of many of the manufacturers.

Air Cooling Economies Outlined in Booklet

A quick and simple investment analysis technique which will determine how much installation of air conditioning can help boost sales and income of stores, restaurants, and similar places of business has been developed by General Electric Co. It can be used also by office and industrial employers to find out how air conditioning can increase employee efficiency.

The formula is available in two booklets, one covering stores and restaurants, and the other industrial and office installations. They may be obtained by writing the Air Conditioning Division, General Electric Co, Bloomfield, N. J.



Clip-Releasing tool and its method of application

Clip-Releasing Tool Aids Fluorescent Fixture Maintenance

JOSEPH STUPENSKY, Maintenance Man, American Gas & Electric Service Corp., New York, N. Y.

Application of a clip-releasing tool permits fluorescent lighting fixtures to be quickly and safely relamped by one man. The simple tool shown releases the two spring clips that hold the enclosure to the supporting chassis during operation. This device can be made with a small piece of hard wood and a small amount of work.

Two tools are inserted through the louver over the center vein beneath the clips at each end and are used as levers simultaneously to prevent jamming. Then the enclosure may be allowed to hang from the chains permanently attaching it to the chassis. The time required by one man to release and lower the frame is now only one minute. This is in comparison with former requirements when as much as 5 minutes, in some cases, and two men were required.

Six month's maintenance experience with the lighting fixtures indicates that spring clips are so stiff that an ordinary man cannot release them with his fingers. If pliers or other inadequate tools are used, either the fixture or clips may be damaged, or the fluorescent tube may break in the maintenance man's face. Two men were formerly required to handle maintenance of each fixture safely until the tool illustrated was devised.

EEI Publishes New Water Heater Material

A new series of electric water heater promotional material has been released by the Edison Electric Institute. It includes a 20-minute film, "How to Stay in Hot Water," sets of kodachrome strips and slides; a folder illustrating eight reasons for installing electric heaters; a booklet, "Matchless Ways to Easy Profits," surveying the market; and a customer booklet, showing how heaters help housewives. A radio spot transcription with singing commercials is also available.

Inquiries and orders should be addressed to EEI at 420 Lexington Ave., New York 17, N. Y.

Fan Display Contest Set by NEMA for May

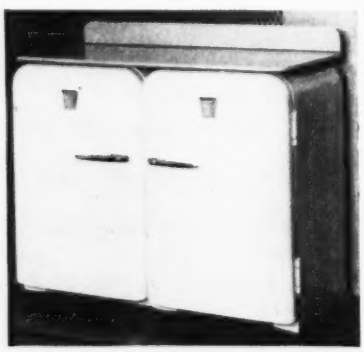
May days will be fan days this year, if the Electric Fan Section of National Electrical Manufacturers Assn has its way. The section is sponsoring what it describes as a "whopping" window display contest among retailers, with $2,500 in Defense Bond prizes.

Winners will be decided on the basis of most ingenious and original displays, which must remain up for at least a week during the month.

Refrigerator and Freezer Teamed Up

Twin appliances — a refrigerator and a freezer—with a counter top make a convenient unit for small kitchens. Such a space-saving and unusual unit is offered by Quicfrez, Inc of Fond du Lac, Wisc. The two appliances have identical exteriors and dimensions. Together, they require less than fifty inches of wall space, yet provide all the advantages of separate units plus 9.3 sq ft of additional work area.

Capacity of the refrigerator is 5.5 cu ft, with a total shelf area of 7.5 sq ft. The freezer's capacity is 4.2 cu ft, and it will hold up to 200 pounds of frozen foods. Freezer and



refrigerators are each 38½ in. high, 24 in. wide, and 28 in. deep. The counter area is provided by a gray milamine plastic top that fits across the refrigerator and freezer.

New Colorado Law Adopted . . .

. . . by the legislature which prescribes the exact subjects for the engineer-in-training and professional engineer tests

New engineer examining legislation to replace a 1951 law ruled unconstitutional early this year has been adopted by the Colorado legislature.

The measure, supported by the engineering societies in Colorado, establishes exact examination subjects and does not grant any powers of discretion to the State Board of Engineer Examiners. The Colorado Supreme Court ruled that the 1951 law granted legislative powers to the board and also that it illegally set up classifications of engineers. There is no classification in the new legislation.

1951 Law Unconstitutional . . . Marvin E. Langsteiner of the Colorado Board of Engineer Examiners said the 1951 law ruled as unconstitutional followed a model law recommended by the National Council of State Boards of Engineer Examiners. The model law did not recommend classifications, Langsteiner said, but it contained such phrases as "approved by the board,"—"as the board may determine," and "of a character satisfactory to the board." Those phrases granted powers of discretion to the board which the court held illegal, Langsteiner pointed out. The court's ruling was on a suit brought by Kenneth Heron of Denver, who contended the board's classification of his registration was illegal.

The 1951 law specified seven classifications. Previously, Colorado had a law setting up 35 classifications of engineers.

No Colorado Engineers Affected . . . None of the 1,650 registered engineers in Colorado is affected by the new legislation, which Gov Dan Thornton is expected to sign. The Colorado Engineers Council, the Colorado Society of Engineers and the Professional Engineers of Colorado supported the measure.

It prescribed exact subjects for the engineer-in-training and professional engineer examinations. The board will draw up questions under the subjects listed. Registration without examination is authorized of a person more than 35 years of age who shall have 12 years or more of lawful practice. It provides that at least four of those years must be practice under the applicant's own license. Tests must be conducted once a year in Denver.

Under 1951 law, 79% of applicants for engineer-in-training and 82% of applicants for professional engineer were registered, Langsteiner said.

LABOR BRIEFS

Recent Labor Settlements with International Brotherhood of Electrical Workers, AFL—Public Service Co of Oklahoma, a 5% wage increase, and Fall River Electric Co 6%.

Brockton Edison Co and Blackstone Valley Gas & Electric Co have granted their workers a 6% wage increase.

More than 5,000 General Electric Co workers voted not to authorize a strike vote at three GE plants in Lynn and Everett, Mass. The vote was taken on a recommendation of the conference board of International Union of Electrical Workers, CIO, deadlocked in wage negotiations with the company.

Unlimited opportunities exist for young people seeking careers in engineering and science, George E. Moore, manager of university relations for the Westinghouse Electric Corp said recently. "No other field," he declared, "presents such a challenge or so stirs the imagination as this, where our wildest dreams are continually being transformed into reality."

American Federation of Labor and Congress of Industrial Organizations hope to end "raiding" as a preliminary step toward eventual unity. "Raiding" is where one union moves into a plant where another union already is established. International Brotherhood of Electrical Workers, AFL, may have something to say about any no-raid agreement. Right now IBEW is battling three CIO unions—utility, electrical, and communications workers.

Establishment of a federal agency to expose Communists who lead or influence labor unions was proposed by Robert D. Blasier, Westinghouse Electric Corp vice president in charge of industrial relations, before the Senate Labor and Public Welfare Committee.

Educational Institutions Enrolling the Most Engineering Students in the United States

Out of 193 educational institutions in the United States, and eight more in Canada which are accredited by the Engineers' Council for Professional Development, the following 15 are shown to be enrolling the greatest number of engineering students, according to the annual compilation made by the American Society for Engineer Education in the fall of 1952.

The 201 institutions had 156,080 engineering undergraduates and 20,469 graduate students enrolled last fall.

Rank	Institution	Undergraduate	Graduate	Total
1.	Illinois Institute of Technology	4,621	920	5,541
2.	Brooklyn Polytechnic	3,190	1,050	4,240
3.	Purdue University	3,808	313	4,121
4.	University of Illinois	3,672	378	4,050
5.	College of the City of New York	3,336	307	3,643
6.	Massachusetts Institute of Technology	2,384	1,027	3,411
7.	New York University	2,278	955	3,233
8.	Georgia School of Technology	2,956	157	3,113
9.	University of Cincinnati	3,049	20	3,069
10.	Pennsylvania State	2,547	207	2,754
11.	Newark (N. J.) College of Engineering	2,114	590	2,704
12.	Texas A. & M.	2,509	68	2,577
13.	Rensselaer Polytechnic	2,186	294	2,480
14.	Ohio State	2,202	274	2,476
15.	Iowa State	2,094	113	2,207

"They've always got lights down the road..."

"That's right, and 'CSP®' Transformers are the answer," reports an official of a western utility.

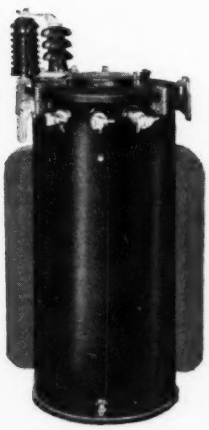
"But farms like this one, just a short distance up the road, are served by an outfit that has not yet taken advantage of 'CSP' Transformers. Gives you a good chance to compare.

"Sometimes a lightning storm—and we get plenty of 'em—means no power up there for as long as 48 hours. On our lines, outages are almost a memory. Even in the rare case when an extreme overload trips a breaker, we can restore service with the 'Emergency Control' in a matter of minutes.

"Another thing. Our rural customers usually report the red warning light on 'CSP' Transformers. That cuts down load checks—and outages."

Installation and maintenance costs for Westinghouse "CSP" (Completely Self-Protecting) Transformers are always lower, because complete lightning and thermal protection is built in, not separately mounted.

Ask your Westinghouse representative for Booklet B-5617A, "Haul 'Em Out—Hang 'Em Up—Forget 'Em"! Or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70663



"CSP" devices . . . originated and patented by Westinghouse

YOU CAN BE **SURE**...IF IT'S

Westinghouse

Accounting Treatment of Accelerated Amortization by State Public Service Commissions

North Carolina—Carolina P&L 1/26/53
Company is permitted and authorized to:

• Amortize for federal income tax purposes over a period of 60 months that portion of the cost of such facilities attributable to defense purposes.

• Provide on its books of account for depreciation on properties covered by necessity certificates at rates consistent with those for like property not covered by necessity certificates and, during the period of amortization of such emergency facilities, charge to the current provision for federal taxes on income in operating expenses and concurrently credit "Earned Surplus Restricted for Future Federal Taxes on Income," amounts equal to the reduction in federal taxes on income resulting from the accelerated amortization of such facilities for federal income tax purposes and after expiration of the effective amortization period, and until "Earned Surplus Restricted for Future Federal Taxes on Income" applicable to specific facilities is exhausted or such facilities are retired from service, charge "Earned Surplus Restricted for Future Federal Taxes on Income" and credit the current provision for federal taxes on income with amounts equal to the increase in federal taxes on income resulting from depreciation on the emergency facilities no longer being available for federal income tax purposes, said charges and credits to the current provision for federal taxes on income in operating expenses shall be made to a subdivision of Account 507, Taxes.

• Follow the same procedures as are authorized in this proceeding with respect to any facilities hereafter constructed in the interest of national defense and attributable to defense purposes for which certificate of necessity may be issued to company under authority of Section 124A of the Internal Revenue Code.

• Elect under provision of said Section 124A of the Internal Revenue Code at any time prior to completion of full amortization, to discontinue such amortization, exclude for federal income tax purposes the amounts allowable under the necessity certificates, and return to normal depreciation allowable for federal income tax purposes.

For earlier accelerated amortization orders see Page 42, Oct. 13, 1952 and Page 77, Jan. 12, 1953 issues of Electrical World

Oklahoma—Public Service of Oklahoma 1/28/53

It is the order of the commission that Public Service Co of Oklahoma be authorized and directed to follow the accounting procedures hereinafter set forth in respect to the portion of the costs of any of its facilities certified pursuant to Section 124A of the U. S. Internal Revenue Code and the resulting reduction of federal income taxes:

• Provide on its books of account for depreciation of properties or facilities covered in whole or in part by necessity certificates at rates consistent with those for like property or facilities not covered by necessity certificates.

• During any period of accelerated amortization of certificated facilities, to provide currently by charge to "Provision for Deferred Federal Income Taxes" as an operating expense and credit "Earned Surplus Restricted for Deferred Federal Income Taxes" amounts equal to the reduction in federal income taxes resulting from the accelerated amortization of such facilities.

• After the expiration of the special amortization period and until "Earned Surplus Restricted for Deferred Federal Income Taxes," is exhausted, the company shall charge "Earned Surplus Restricted for Deferred Federal Income Taxes," and credit an account entitled "Portion of Current Federal Income Taxes on Income Deferred in Prior Years" with an amount equal to the increase in federal income taxes resulting from the fact that the ordinary depreciation deduction applicable to the emergency facilities is no longer available for federal income tax purposes.

• This order shall not be construed as an adjudication of any issue which may arise in any future rate proceeding.

South Carolina—Carolina P&L 1/27/53
Company is permitted and authorized to:

• Amortize for federal income tax purposes over a period of 60 months that portion of the cost of such facilities attributable to defense purposes.

• Provide on its books of account for depreciation on properties covered by necessity certificates at rates consistent with those for like property not covered by necessity certificates and, during the period of amortization of such emergency facilities, charge to the current provision for federal taxes on income in operating expenses and concurrently credit "Earned Surplus Restricted for Future Federal Taxes on Income," amounts equal to the reduction in federal taxes on income resulting from the accelerated amortization of such facilities for federal income tax purposes and after expiration of the effective amortization period, and until "Earned Surplus Restricted for Future Federal Taxes on Income" applicable to specific facilities is exhausted or such facilities are retired from service, charge "Earned Surplus Restricted for Future Federal Taxes on Income" and credit the current provision for federal taxes on income with amounts equal to the increase in federal taxes on income resulting from depreciation on the emergency facilities no longer being available for federal income tax purposes, said charges and credits to the current provision for federal taxes on income in operating expenses shall be made to a subdivision of Account 507, Taxes.

• Follow the same procedures as are authorized in this proceeding with respect to any facilities hereafter constructed in the interest of national defense and attributable to defense purposes for which certificates of necessity may be issued to company under authority of Section 124A of the Internal Revenue Code.

• Elect under the provisions of said Section 124A of the Internal Revenue Code at any time prior to completion of full amortization, to discontinue such amortization, exclude for federal income tax purposes the amounts allowable under the necessity certificates, and return to normal depreciation allowable for federal income tax purposes.

Washington—Washington Water Power Co 3/10/53

Substantially, the accounting treatment to be used by the company as will be ordered hereinafter is as follows:

• During the 60-month period of rapid amortization:

1. Income statements and net income transfers to earned surplus shall reflect actual federal tax on income liability which computes as applicable to net taxable income after the application of the tax benefit resulting from the accelerated amortization.

2. Federal taxes on income stated actually on income statements shall be footnoted as per Appendix A-I to reveal the estimated portion of tax deferment associated with the statement period due to the benefit of accelerated amortization.

3. Transfers to earned surplus shall be divided as follows:

(a) That portion which is equivalent to the estimated deferment of federal tax on income due to accelerated amortization shall be credited to Account 271.1, "Earned Surplus—Restricted (Amount of Federal Income Taxes Deferred Due to Accelerated Amortization of Certain Facilities)."

(b) That portion which remains shall be credited to Account 271, "Earned Surplus." The balance in Account 271.1 is restricted as to distribution for dividends and to any other distribution except as will be set forth hereinafter. Financial statements prepared by the company at any time a balance is reflected in Account 271.1 shall set forth this balance separately and shall footnote this account to read as indicated in Appendix A-II.

• After the expiration of the 60-month rapid amortization period:

1. Income statements and transfers of net income to earned surplus shall reflect actual federal tax on income liability, which computes from the net taxable income having reflected therein no benefit from the fully amortized investment.

2. Federal taxes on income as reported actually for the statement period shall be footnoted as indicated in Appendix A-III and shall reveal the estimated amount of the deferred federal tax on income which is included within the statement, and which is an excess due to the earlier complete amortization of the depreciable investment.

3. Net income transfers to earned surplus shall be in total to Account 271. Further, an amount equal to 1/12 of 1/25 of the total balance accumulated in Account 271.1 at the expiration of the 60-month rapid amortization period shall be transferred each month to Account 271 until the total accumulation in Account 271.1 is exhausted. The footnote as set forth in Appendix A-II, shall be continued with all financial statements rendered until the balance in Account 271.1 is exhausted.

Today in Utility Finance

YIELDS (%)

Quality	Bonds 1st	Bonds 2nd	Bonds 3rd	Preferred Stocks 1st	Preferred Stocks 2nd	Preferred Stocks 3rd	Common Stocks 1st	Common Stocks 2nd	Common Stocks 3rd
DATE 1953									
April 16	**3.27**	**3.34**	**3.50**	**4.26**	**4.50**	**4.72**	**5.03**	**5.44**	**5.60**
April 9	3.19	3.26	3.45	4.19	4.46	4.69	5.01	5.45	5.58
END OF QTR.									
1st 1953	3.15	3.23	3.39	4.16	4.41	4.66	4.95	5.24	5.50
4th 1952	2.99	3.03	3.14	4.06	4.22	4.59	4.98	5.33	5.62
3rd 1952	2.99	3.03	3.16	4.10	4.26	4.61	5.18	5.59	5.96
2nd 1952	2.95	3.00	3.09	4.05	4.31	4.60	5.38	5.85	6.42

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
Alabama Power	12	Mar.	$11,866,086	$11,490,787	$....	$....
Central Hudson Gas & Electric	12	Mar.	2,409,932	1,889,834	0.88	0.79
Georgia Power	12	Mar.	12,274,658	10,459,878	....	....
Minnesota Power & Light	12	Mar.	3,461,267	3,312,845	3.36	3.18
			1952	**1951**	**1952**	**1951**
California Electric Power	12	Dec.	$2,735,940	$1,605,833	$0.89(a)	$0.54(a)
El Paso Electric	12	Dec.	1,554,388	1,457,449	1.95	1.82
Hilo Electric Light	12	Dec.	174,286	.....	2.32	2.07
Iowa Electric Light & Power	12	Dec.	2,178,144	1,975,385	1.65	1.47
Iowa Public Service	12	Dec.	2,667,806	2,620,027	....	....
Michigan Gas & Electric	12	Dec.	466,000	391,300	2.97	2.40
Montana Power	12	Dec.	7,639,010	7,137,635	2.69	2.49
Philadelphia Electric	12	Dec.	27,330,322	25,461,530	2.20	2.03
Public Service of New Mexico	12	Dec.	1,091,363	1,016,556	0.79	....

Notes: Figures for last nine companies have been audited.
(a) Based on 2,353,551 shares in 1952 and 1,679,928 shares in 1951.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF APRIL 9–15			
Bonds			
Blackstone Valley Gas & Electric—1st mtg 4⅛% due 1983	$5,800	102.17%	4.0%
Preferred Stock			
Louisiana Power & Light—60,000 sh 4.96% $100 par	$6,000	102.25%	4.85%
Savannah Electric & Power—23,000 sh 5.36% $100 par	2,300	100	5.36%
SCHEDULE FOR APRIL—MAY—JUNE			
Bonds			**Bid Date**
Detroit Edison—1st mtg due 1988	$40,000	.....	April 28
Wisconsin Public Service—1st mtg due 1983	8,000	.....	May 5
Alabama Power—1st mtg due 1983	18,000	.....	May 12
New Orleans Public Service—1st mtg due 1983	6,000	.....	May 12
Central Power & Light—1st mtg due 1983	8,000	.....	May 15
Texas Power & Light—1st mtg	5,000	.....	May 18
Metropolitan Edison—1st mtg due 1983	8,000	.....	May 19
Pacific Gas & Electric—1st mtg due 1988	65,000	.....	May 19
Philadelphia Electric—1st mtg	30,000	.....	May 25
Gulf Power—1st mtg due 1983	7,000	.....	June 9
Pennsylvania Electric—1st mtg due 1983	12,500	.....	June 23
Arkansas Power & Light—1st mtg	18,000*	.....	.....
Louisiana Power & Light—1st mtg	10,000*	.....	.....
New Jersey Power & Light—1st mtg	5,500	.....	.....
Southern California Edison—1st mtg	25,000	.....	.....
Washington Water Power—1st mtg	10,000	.....	.....
Metropolitan Edison—1st mtg	8,000	.....	.....
Public Service Electric & Gas—1st mtg	50,000	.....	.....
Debentures			
Montana Power—debentures due 1978	$18,000	.....	May 4
Washington Water Power—debentures	18,000	.....	.....
Preferred Stock			
Wisconsin Public Service—30,000 sh $100 par	$3,000	.....	April 28
Long Island Lighting—100,000 sh $100 par	10,000	.....	May 6**
Philadelphia Electric—150,000 sh	15,000	.....	May 12
Texas Power & Light—70,000 sh	7,000	.....	May 18
Arkansas-Missouri Power—40,000 sh 5½% $25 par	1,000	.....	.....
Public Service of Indiana—600,000 sh $25 par	15,000	.....	.....
Southern California Edison—150,000 sh	15,000	.....	.....
Common Stock			
Montana-Dakota Utilities—293,108 sh (to be offered common-holders on 1-for-5 basis)	$.....	.....	.....
Arkansas-Missouri Power—47,413 sh (being offered to common-holders on 1-for-8 basis record March 31 to expire about May 5)	.....	.....	.....
New England Electric System—about 829,000 sh (to be offered commonholders on 1-for-10 basis, record about June 10 to expire June 25)	.....	.....	June 10
Public Service of Indiana—472,000 sh (to be offered common-holders on 1-for-8 basis)	.....	.....	.....
Texas Utilities	15,000	.....	June 2
American Gas & Electric—800,000 sh	.....	.....	June 9
General Public Utilities—about 570,000 sh (to be offered common-holders on 1-for-15 basis, record about June 4)	.....	.....	.....

Notes—* Estimated. ** To be offered by W. C. Langley & Co—Blyth & Co—First Boston group.

GE 1st Quarter Sales, Income Set New Records

First quarter sales and earnings of General Electric Co broke all previous records, Ralph J. Cordiner, president, told more than 2,200 stockholders attending the company's 61st annual meeting held recently at Schenectady, N. Y.

Cordiner made it clear to stockholders that General Electric has not been frightened into curtailing its operations by what often is termed the Korean peace scare.

He reported that sales for the first quarter of 1953 were $777,819,000, an increase of 39% over the $560,577,000 for the same period last year, GE's highest first quarter in company history. Earnings are expected to rise to $45,849,000, or $1.59 a common share against $29,024,000, or $1.01 in 1952.

Cordiner said the rise in profits was attributed not only to increased sales but also to the fact that first-quarter results were based on the present tax law with excess profits computed at half the 1952 rate. He added that if the excess profits tax is extended at the 1952 rate, earnings for the first quarter will be reduced to $33,849,000, or $1.17 a share.

The company, Cordiner revealed, plans to spend more than $500 million for general expansion in the next three years to bring post-war expenditure for new plant and equipment to $1.1 billion.

Refined Copper Stocks Decrease During March

Stocks of refined copper held in the United States by members of the Copper Institute, Inc. at the end of March amounted to 55,807 tons, a decrease of 5,137 tons below the 60,944 tons held on Feb. 28.

During March deliveries to domestic fabricators increased to 133,462 tons compared with deliveries of 117,204 in February. Refined production also increased to 112,016 tons from 101,538.

Outside the United States refined stocks totaled 133,267 tons on March 31, an increase of 11,044 tons above the 122,223 tons on Feb. 28. March deliveries increased to 71,420 tons from 65,195 in February and refined production was 104,926 tons compared with 88,539.

Benjamin Electric Mfg Buys Leader Electric

Purchase of certain assets of the Leader Electric Co, Chicago, by Benjamin Electric Manufacturing Co, Des Plaines, Ill., has been announced by Hoyt P. Steele, executive vice president of Benjamin Electric.

The Leader line which includes incandescent and fluorescent commercial light equipment, is now being manufactured and sold by the Leader Division of Benjamin Electric.

Washington State Victor in GE Court Tax Fight

General Electric Co cannot recover more than $1 million in business and occupation taxes it has paid to the State of Washington on work done for the Atomic Energy Commission at Hanford Works, the Washington State Supreme Court has ruled.

The decision reverses a decision of a lower court. General Electric and the federal government maintained the company actually was an agency of AEC at Hanford and therefore was exempt from state taxes. The court rules, however, that under GE's contract with the AEC "the incidence or impact of the tax falls only on General Electric as a business corporation and not as an agency or instrumentality of the United States."

General Electric's contract, dating back to 1946, provides that it receive $1 a year with the federal government bearing all operating costs, including the protested state tax.

"The manufacturing of fissionable material (by GE) is done by it not as an agent or instrumentality of the United States, but as a part of its authorized corporate functions," the opinion declared. "The taxpaying status (of GE) must be determined by our statutes and not by any status or relationship attempted to be created by contract."

MANUFACTURING BRIEFS

Mitchell Manufacturing Co, Chicago, manufacturer of room air-conditioners and industrial lighting equipment, is contemplating erection of a plant in the Southwest. The company has started a survey of possible sites in the Dallas area.

Production of primary aluminum in the United States during February totaled 185,297,920 lb, the Aluminum Association has reported. This production is the highest February output on record and also establishes an all-time daily high with its average output of 6.6 million lb per day. February production topped the peak February, 1944, output of 148.8 million lb by about 25%. February, 1953, also outproduced the 144,747,395 lb in February, 1952, by 28%.

Bridgeport Brass Co will open a new warehouse in Louisville, Ky., May 1st to meet increased demand for brass and copper products in that area. Bridgeport Brass recently moved its New England warehouse facilities at Providence to a new and larger location in the same city.

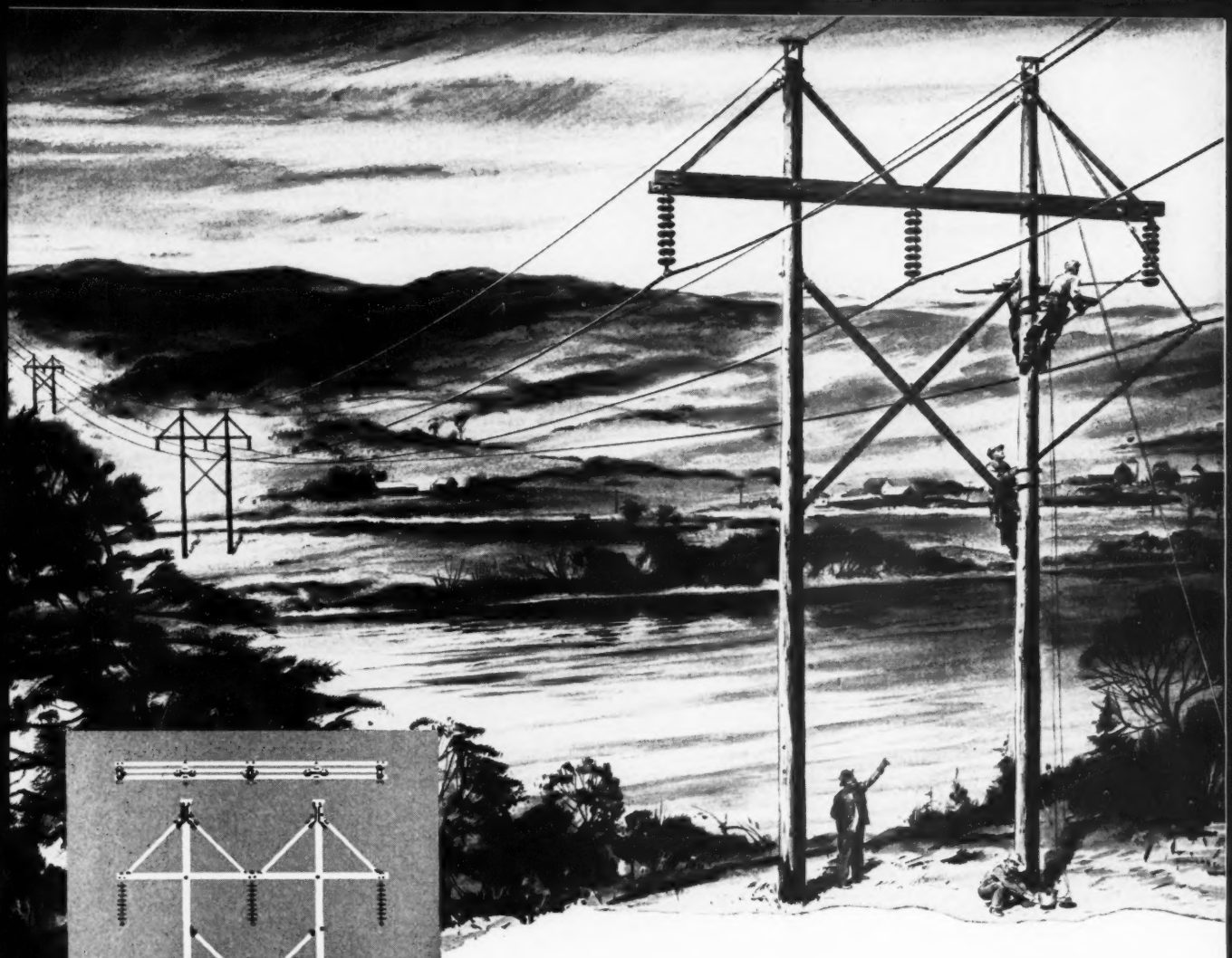
Pending completion of its new $10 million electric meter manufacturing plant at Raleigh, N. C., Westinghouse Electric Corp will begin partial operations in a rented temporary location there early next month.

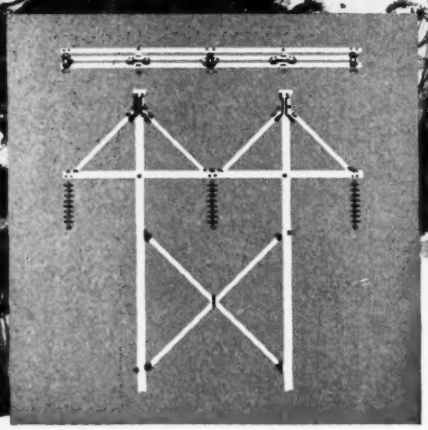
Joseph T. Ryerson & Son, Inc, has started construction of a new steel

MANUFACTURERS' EARNINGS

Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
Dow Chemical	9	Feb.	$25,269,416	$25,706,753	$1.11	$1.13(a)
Johns-Manville	3	Mar.	4,943,491	5,508,387	1.56	1.74
Worthington	3	Mar.	1,190,852	1,506,258	1.02	1.41

Notes—(a) Based on shares now outstanding.





Type No. 702 —
Tangent Structure with braces . . .
for voltages 69 to 154 KV*

LIST OF MATERIAL

Quantity	Description
2	Crossarm
3	Steel spacer w/mounting bolts
2	Stud bolt ⅞" w/washer nuts and locknuts
1	Bent stud bolt ⅞" x 8" w/2 sq. nuts
2	Bent bolt ⅞" x 5½" w/sq. nut
4	Vee Brace 3⅜" x 4⅜" cross section
1 set	Cross brace w/fittings, clamp, ⅞" pole bolts, curved washers
2	Static wire support
4	Machine bolt ¾" w/locknuts
2	Clevis
2	Suspension clamp for static wire
as req'd	Suspension insulators & fittings

**This print was reproduced from the Graybar Bulletin GB-5076A on High Voltage Transmission Line Materials. This 92-page book covers, in condensed form, Graybar materials for line construction. Write us, if you do not already have your free copy.*

How Graybar Methods and Manpower help Standard Construction Practice

You can read in the open country of America the story of our rapid growth in production capacity. New transmission lines, reaching out over plains, mountains and rivers foretell our multiplying strength in building for defense and for better living.

Standard construction practice in transmission line building has given new facility to this basic work. And through its network of 109 offices and warehouses, Graybar contributes substantially to line building speed. Graybar's ability to deliver "packaged" crossarm assemblies for any line structure is a case in point. Fabricated and fitted with hardware to your specifications, the complete crossarm units can be delivered to the job at costs far less than those entailed in separate field handling. And, to complete the "package" Graybar Outside Construction Specialists are always on call to render technical help on out-of-the-ordinary problems. *Graybar Electric Company, Inc. Executive offices: Graybar Building, 420 Lexington Avenue, New York 17, N. Y.* 308-94

CALL GRAYBAR FIRST FOR...

GraybaR Everything Electrical

IN OVER 100 PRINCIPAL CITIES

service plant for its operations in Milwaukee. Scheduled for completion early in 1954, the new plant, which will consist of two large production units and an office building, will contain about 166,000 sq ft of floor space—about three times present plant capacity. Total cost of the plant has not been revealed.

SALES ASSIGNMENTS

COMPANY STAFFS

Westinghouse Electric Corp has named Harold G. Rethmeyer branch manager of its newly established San Francisco branch office which will service apparatus customers in northern California and western Nevada. Dwight R. Hoopes, formerly engineering and service supervisor at Salt Lake City, was appointed San Francisco branch engineering manager. John H. Foster becomes branch service manager. Edward H. Hulse was made engineering and service supervisor of the Sale Lake City office, replacing Hoopes.

Minneapolis-Honeywell Regulator Co has assigned Paul Feeger to its Albuquerque industrial sales engineering staff. Feeger, who transferred from the firm's Denver office, will specialize in the sales and service of the Industrial and Valve Division's products.

Allis-Chalmers Manufacturing Co has designated Richard D. Moody as manager of the new Rocky Mountain region, which combines the A-C district and branch office territories of Denver, Salt Lake City, Phoenix, El Paso, and Spokane. Moody, since 1950 manager of the Los Angeles district office, will make his headquarters at Denver. Successor to Moody at Los Angeles is Richard L. Engel, a representative in that office.

Utica Drop Forge & Tool Corp has appointed Paul L. Thornburg as factory representative for its complete line of tools in the mid-south area of Virginia, North Carolina, South Carolina, and Tennessee. Thornburg has served Utica as a manufacturer's representative since 1948.

Holophane Co. Inc, New York, has announced the following territorial appointments: Daniel R. Donnelly as New York district manager will service the Greater Metropolitan area in co-operation with Edward L. Gluck and Willard L. Warren. Robert W. Stanley will serve as district manager in the state of Connecticut and western Massachusetts with headquarters in Hartford, and Adriaan Van Oss will serve as district manager in the state of Michigan with headquarters in Detroit.

Graybar Electric Co, New York, has named J. E. Carroll district sales manager at Cincinnati. With the company since 1935, he has been commercial sales manager of Graybar for the past four years.

Automatic Switch Co, Orange, N. J., has designated Frank E. Reeves as head of its new Los Angeles sales engineering organization. Reeves has been associated with consulting engineering firms, utilities, and industrial companies as an electrical design engineer. Automatic Switch's newly opened factory branch is located at 923 E. 3rd St., Los Angeles.

MEETINGS CALENDAR

***Rocky Mountain Electrical League**
Annual Spring Conference, Shirley Savoy Hotel, Denver, Colo., April 26-28; 50th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo., Sept. 20-23.

American Society of Mechanical Engineers
Spring Meeting, Deshler-Wallick Hotel, Columbus, Ohio, April 28-30; Semi-Annual Meeting, Statler Hotel, Los Angeles, June 28-July 2; Fall Meeting, Sheraton Hotel, Rochester, N. Y., Oct. 5-7; Annual Meeting, Statler Hotel, New York, Nov. 29-Dec. 4.

American Institute of Electrical Engineers
Northeastern District Meeting, Sheraton Plaza Hotel, Boston, April 29-May 1; Conference on Electric Heating sponsored by Committee on Electric Heating and Michigan Section, AIEE, Detroit-Leland Hotel, Detroit, May 26-27; Summer General Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 15-19; Pacific General Meeting, Hotel Vancouver, Vancouver, B. C., Sept. 1-4; Middle-Eastern District Meeting, Daniel Boone Hotel, Charleston, W. Va., Sept. 29-Oct. 1; Fall General Meeting, Muehlebach Hotel, Kansas City, Mo., Nov. 2-6.

Pennsylvania Electric Association
Spring Meeting, Communications Committee, Hotel Roosevelt, Pittsburgh, April 30-May 1; Spring Meeting, Relay Committee, Valley Forge Hotel, Norristown, Pa., May 7-8; Industrial Sales Conference, Galen Hall, Wernersville, Pa., May 7-8; Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, May 12-13; Hydraulic Power Committee, Yorktowne Hotel, York, Pa., May 14-15; Transmission-Distribution Committee; Irem Temple Country Club, Dallas, Pa., May 14-15; Systems Operation Committee, Skytop Lodge, Skytop, Pa., May 21-22; Prime Movers Committee, Beachcombers Resort Hotel, Erie, Pa., May 28-29.

Edison Electric Institute
Accident Prevention Committee, Edgewater Beach Hotel, Chicago, May 4-5; Transmission-Distribution Committee, Edgewater Beach Hotel, Chicago, May 5-6; Electrical Equipment Committee, Sir Walter Hotel, Raleigh, N. C., May 11-12; Meter-Service Committee, Wentworth-by-the-Sea, Portsmouth, N. H., May 25-27; 21st Annual Convention, Convention Hall, Atlantic City, N. J., June 1-4; Hydraulic Power Committee, Portland, Ore., June 15-16.

Northwest Electric Light & Power Association
Business Development Section, Davenport Hotel, Spokane, Wash., May 4-6.

***Public Information Program**
Steering Committee, Hotel Blackstone, Chicago, April 30; Mid-Atlantic Region, Hotel Biltmore, New York, May 1; West North Central Regional Meeting, Russell Lamson Hotel, Waterloo, Iowa, May 5; Steering Committee, Hotel Traymore, Atlantic City, N. J., June 1; Steering Committee, Edgewater Beach Hotel, Chicago, Oct. 21; Workshop Conference, Edgewater Beach Hotel, Chicago, Oct. 22-23.

Electric Lines Club of New England
Spring Meeting, University Club, Boston, Mass., May 6.

Northwest Public Power Association
Annual Convention, Ridpath Hotel, Spokane, Wash., May 6-8; Accounting Section, Monticello Hotel, Longview, Wash., Sept. 17-18.

Great Lakes Power Club
Spring Meeting, Indianapolis Athletic Club, Indianapolis, Ind., May 7-8.

Public Utilities Advertising Association
National Convention, Chase Hotel, St. Louis, May 7-8.

Chicago Electrical Industry Show
Sponsored by Electric Association and Electrical Maintenance Engineers of Chicago, Conrad Hilton Hotel, Chicago, May 11-14.

American Public Power Association
Tenth Annual Convention, Sheraton Plaza Hotel, Boston, May 12-14.

Pacific Coast Electrical Association
Annual Convention, Hoberg's, Lake County, Calif., May 13-15.

Georgia Institute of Technology
Conference on Protective Relaying, Atlanta, Ga., May 14-15.

Illuminating Engineering Society
East Central Regional Conference, Lord Baltimore Hotel, Baltimore, Md., May 14-15; Southern Regional Conference, Sedgefield Inn, Greensboro, N. C., May 18-19; Great Lakes Regional Conference, Syracuse Hotel, Syracuse, N. Y., May 25-26; National Technical Conference, Hotel Commodore, New York, Sept. 13-17.

Electrical Manufacturers' Representatives Association of Michigan, Inc
1953 Electrical Exhibition, State Fair Grounds, Exhibition Bldg., Detroit, May 19-22.

Southeastern Electric Exchange
Industrial Power Sales Conference, Fort Sumter Hotel, Charleston, S. C., May 21-22.

Interstate Power Club
Joint Meeting with Power Engineer's Association, Lawn Club, New Haven, Conn., May 22; Hotel Martinique, New York, Oct. 5; Hotel Martinique, New York, Dec. 7.

National Association of Purchasing Agents
Annual Meeting, Statler Hotel, Los Angeles, May 24-27.

National Association of Electrical Distributors
45th Annual Convention, Conrad Hilton Hotel, Chicago, May 24-29; Spring Meeting, Pacific Zone, Huntington Hotel, Pasadena, Calif., June 8-10.

California Municipal Utilities Association
Annual Conference, Clift Hotel, San Francisco, June 9-12.

New England Meter Engineers
General Electric Co's Meter Plant, West Lynn, Mass., June 12.

Michigan Electric Association
Annual Meeting, Mackinac Island, Mich., June 21-24.

***Wisconsin Utilities Association**
Accounting Section Convention, Schwartz Hotel, Elkhart Lake, Wis., June 21-23; Sales-Service Section Convention, Schroeder Hotel, Milwaukee, Nov. 11-13.

Canadian Electrical Association
Annual Convention, Manoir Richelieu, Murray Bay, Que., June 25-27.

American Society for Testing Materials
Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 29-July 3.

International Association of Electrical Leagues
18th Conference, Fairmount Hotel, San Francisco, Aug. 5-8.

Maryland Utilities Association
Fall Conference, Cavalier Hotel, Virginia Beach, Va., Sept. 18-19.

Instrument Society of America
8th National Instrument Exhibit, Sherman Hotel, Chicago, Sept. 21-25.

***International Association Electrical Inspectors**
Silver Jubilee Meeting, Edgewater Beach Hotel, Chicago, Sept. 21-26.

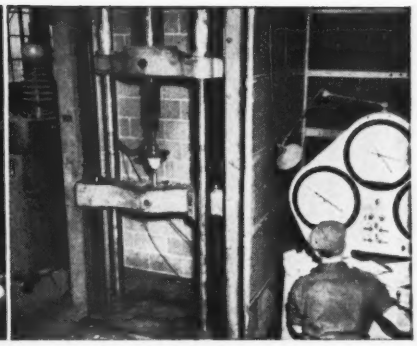
National Electrical Industries Show
Sponsored by Eastern Electrical Wholesalers' Association, 69th Regiment Armory, New York, Sept. 29-Oct. 2.

***Iowa Utilities Association**
Management Conference, Hotel Fort Des Moines, Des Moines, Oct. 12-13.

***American Standards Association**
4th Annual Standardization Conference and 35th Annual Meeting, Waldorf-Astoria, New York, Oct. 19-21.

National Electrical Manufacturers Association
Annual Meeting, Haddon Hall, Atlantic City, N. J., Nov. 9-12.

*Addition this week.

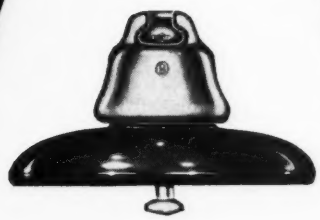


WE SMASH A CARLOAD OF SUSPENSION INSULATORS A MONTH . . . JUST TO BE SURE OF A CURVE!

This may seem strange - - one of the biggest users of O-B suspension insulators (a carload a month on standing order) gets them for nothing and merely smashes 'em up!

Enough suspension units to build some 20 miles of 69-kv line, each month, go to our laboratory for destructive test. Such extensive research makes possible the location of a truly representative number of points on a characteristic curve of normal distribution, and permits scientific statistical analysis of production.

Such costly vigilance pays off by taking guess-work out of a product whose primary virtue is dependability. Because *we* won't guess at the quality of O-B suspension insulators, *you* don't have to.



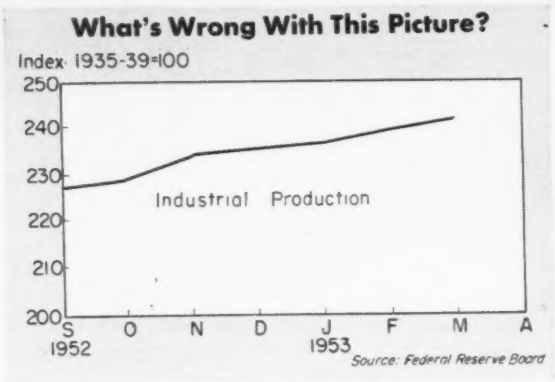
Ohio Brass

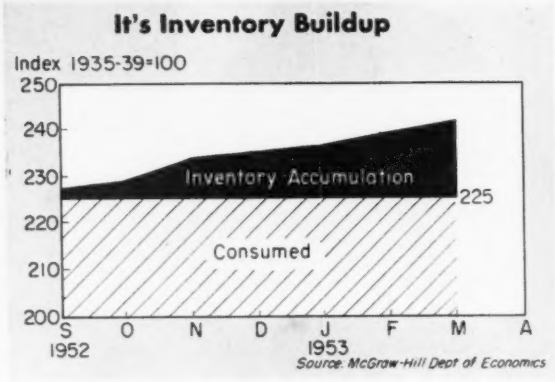
MANSFIELD OHIO, U.S.A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4390-H

ELECTRICAL BUSINESS OUTLOOK





Big Worry: Not 'Peace', but Inventory

The Communist "peace" drive gets the most attention in talk about the business outlook these days. Economists, businessmen and stockholders all wonder if the Kremlin's soft words mean defense cutbacks and a slide in business activity. The signs of worry show up in the stock markets and the newspaper headlines.

All this talk obscures an inventory buildup that is much more likely to cause trouble than any immediate cutbacks in defense work. Cuts in the defense program are not likely to be substantial—unless the Russians go a lot further than they have yet in proving their good intentions. Inventory trouble could cut industrial activity a lot faster than any expected change in defense over the next year or two.

Business Stockpile Is Up . . . Business has been adding rapidly to its stock of goods since sometime last fall. Inventories increased at an annual rate of about $7.5 billion in the fourth quarter of 1952, and they have been building up at a somewhat slower rate since then.

A large part of the big buildup has been in stocks of material. Last fall, industry began replacing steel stocks that ran down during the big strike last summer. And stocks of other materials and semi-fabricated parts have been built up in anticipation of heavy consumer demand. Recently, more of the inventory has been in finished goods —especially consumer durables like cars and refrigerators. Manufacturers are apparently building more of these products with two purposes in mind. They expect heavy sales this year; so they think they can get rid of inventory—and they all want to capture a bigger share of the market.

It's hard to figure exactly how much is going into inventories today. Statistics on inventories are unreliable. And they lag far behind current developments. In addition, stocks of soft goods are actually declining as a result of strong retail sales. For the time being, the drop in these stocks offsets some of the rise in stocks of durable goods. The charts (above) give one estimate of the degree of inventory building. In March, the index of industrial production was about 240. Probably only about 225 points on the index represented actual consumption—the rest went into inventories. That's about 6% of the production covered by the index but about 13% of durable goods output.

Is this a dangerous overexpansion which will cause people to dump inventories later on? There are signs that it is.

Industrial prices have been rising—which is one of the signs of an inventory boom. Average wholesale prices have been held down by weakness in farm prices. But copper, some steel products, building materials and industrial chemicals have all gone up. Price rises indicate that business has been scrambling for materials.

There are signs that this scramble for materials is not actually justified by demand for finished products. Chrysler Corp has reduced prices on all its cars—hardly a mark of overwhelming demand. Some electric appliance makers have been shading prices to boost sales.

And production itself in many lines is far above any expected level of sales. For example, the rush to get a larger share of the market has boosted output of TV sets and most electric appliances far ahead of the rates sales analysts have predicted for the full year of 1953. In other words, it's almost impossible to avoid a cutback later this year.

Boom, Boom, BOOM? . . . It's clear that inventory building is behind a substantial part of the current boom in industrial production. And that means the boom is vulnerable. Even if present stocks are not too high—if inventories level off without starting down—industrial production would fall by about 6%, and production of durable goods would fall somewhat more.

This would be uncomfortable but not serious for the economy. The real danger, of course, is that overstocking will lead to an inventory recession, in which everyone cuts production and new orders sharply until his stocks are run down—as happened in 1949. Such a development could knock 25 points off the index in a few months.

CHECK MOLONEY *HiperCore** TRANSFORMERS

against the field for Lighter Weight, Smaller Size, Operating Advantages

3 Kva LL Conventional HiperCore Transformer including oil . 120 lbs.

3 Kva CSP Class A HiperCore Transformers including oil . 140 lbs.
(5000 volts and below)

3 Kva CSP Class A HiperCore Transformer including oil . 155 lbs.
(Above 5000 volts)

Easier to install—easier to store—less maintenance

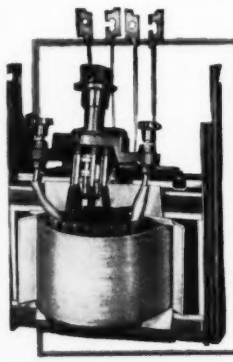
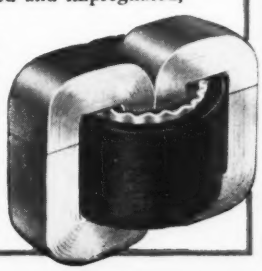
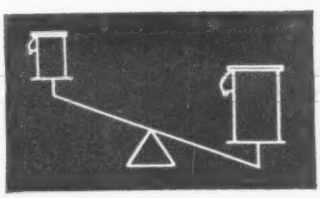


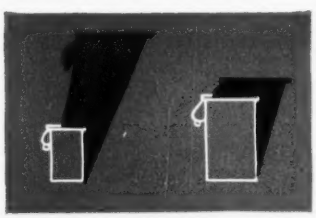
Illustration shows core-and-coil assembly. Cores are wound, annealed and impregnated, then cut into pairs of U-shaped pieces. Matching U-shaped pieces are then placed in position around the coil to complete the magnetic circuit. Core faces are cemented together. Steel bands are used to obtain tight joints.



15% TO 30% LIGHTER

because the cold rolled high permeability, oriented silicon core steel has 30% to 35% higher flux carrying capacity. This makes possible the use of smaller cores and windings. Easier to handle and install than transformers having cores of hot rolled steel, these smaller and lighter transformers take up less space on the pole, in the storeroom and on the line truck.



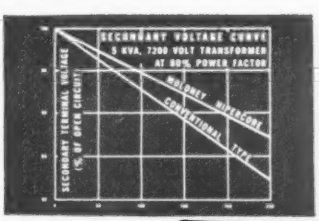


GREATER SHORT-TIME OVERLOAD CAPACITY

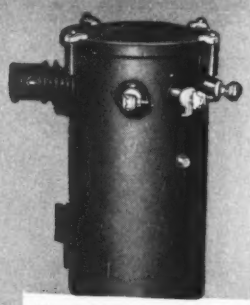
Moloney HiperCore Transformers have improved short-time overload characteristics which provide better peak load performance and longer life. Reduced coil mass, achieved through use of oriented steel cores, together with the extensive use of cooling ducts, results in more rapid cooling of the windings and in a lower hottest-spot temperature gradient.

BETTER VOLTAGE REGULATION

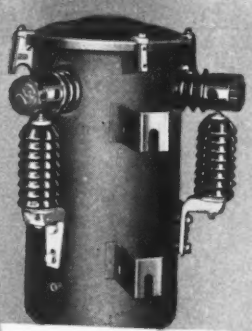
The smaller cores of HiperCore Transformers make possible windings having lower impedance. Lower impedance provides lower internal voltage drop at all loads. This is especially important during peak load periods, since HiperCore Transformers can carry higher overloads than older types, at the same permissible regulation.



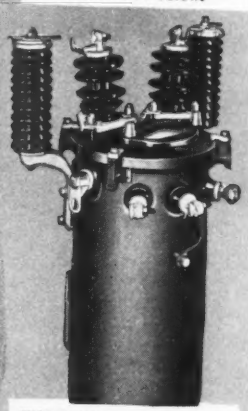
WRITE FOR BULLETIN H-305



TYPE LL—Conventional **HiperCore** Transformer manufactured in standard sizes from 3 to 100 Kva in all standard voltages below 5000 volts.



TYPE CSP—CLASS A **HiperCore** Transformer manufactured in standard sizes from 3 to 100 Kva in all standard voltage ratings of 5000 volts and below.



TYPE CSP—CLASS A **HiperCore** Transformer manufactured in standard sizes from 3 to 100 Kva in all standard voltage ratings above 5000 volts.

* High permeability, cold-rolled, oriented, silicon steel

ME52-28 Rev

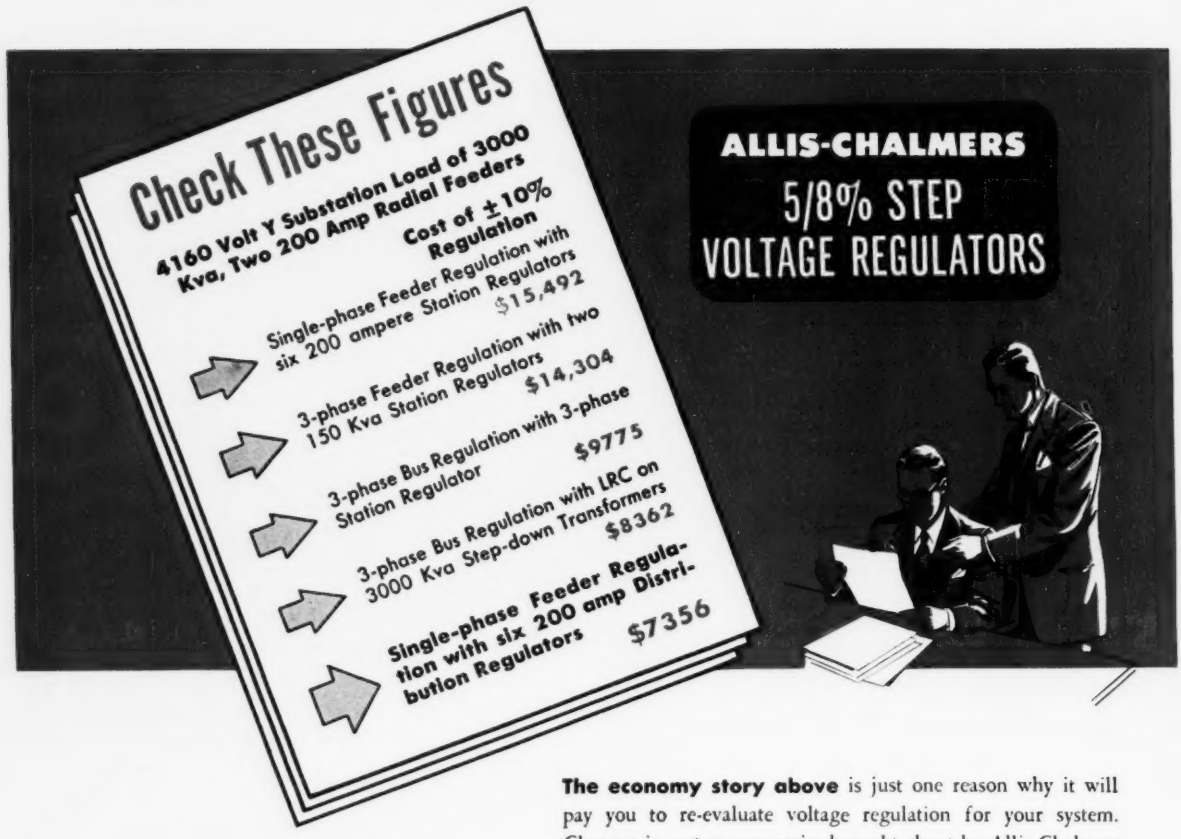
MOLONEY ELECTRIC COMPANY

Sales offices in all Principal Cities

FACTORIES AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA

MOLONEY ELECTRIC = BETTER PERFORMANCE · GREATER RELIABILITY · LESS MAINTENANCE

Comparison Proves You Can Reduce Regulation Costs


Check These Figures
4160 Volt Y Substation Load of 3000 Kva, Two 200 Amp Radial Feeders
Cost of ±10% Regulation
Single-phase Feeder Regulation with six 200 ampere Station Regulators
$15,492
3-phase Feeder Regulation with two 150 Kva Station Regulators
$14,304
3-phase Bus Regulation with 3-phase Station Regulator
$9775
3-phase Bus Regulation with LRC on 3000 Kva Step-down Transformers
$8362
Single-phase Feeder Regulation with six 200 amp Distribution Regulators
$7356
ALLIS-CHALMERS
5/8% STEP VOLTAGE REGULATORS

This Single Example Shows How You Save At Least

$1006.00

Over Previous Lowest Cost Equipment

The economy story above is just one reason why it will pay you to re-evaluate voltage regulation for your system. Changes in system economics brought about by Allis-Chalmers distribution regulators may add up to better regulation and lower costs.

In many cases you can now bring the advantages of individual phase regulation to every feeder in a system. Both utility and consumer benefit. You get ± 1 volt accuracy, 20% range of regulation. You can increase revenue — and profits.

Get High Quality Regulation

Allis-Chalmers distribution regulators bring you all the advantages of 20 years of regulator progress. You can get more facts on these low-cost, reliable units — plus a set of six cost comparison charts to help analyze your system — by calling your nearby A-C district office or writing Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4044

ALLIS-CHALMERS

Originators of 5/8% Step Regulation